

QUEENSLAND AGRICULTURAL JOURNAL

VOL. XVIII.

NOVEMBER, 1922.

PART 5.

ORGANISATION OF THE AGRICULTURAL INDUSTRY.

The Queensland Producers' Association.

Monthly Record of Progress and Achievement.

The last Regular Meeting of the Council of Agriculture was held in the Council Room, Teachers' Training College Building, Turbot street, Brisbane, on 19th October. Subjoined is a Record of Proceedings covering many matters of first importance to the Farming Industry.

Attendance.

In the absence of the President (Hon. W. N. Gillies), the chair was taken by the Vice-President (Mr. J. Purcell).

There were present: Messrs. J. W. Davidson, E. Graham, T. Flood Plunkett, W. Purcell, H. Keefer, F. M. Ruskin, H. I. H. Ross, W. Ranger, S. J. Howe, J. T. Tod, F. J. Morgan, T. Muir, R. Swan, T. A. Powell, W. G. Bachelor, C. H. Pritchard, C. V. Hives, the Director (L. R. Macgregor), and the Secretary (J. F. McCaffrey).

ADMINISTRATIVE COMMITTEE.

Expert Accountancy Committee.

In connection with the Expert Committee to be appointed to consider the question of a uniform accountancy system for butter and cheese factories, Mr. A. E. Neville, Standard Dairy Company (representing butter factories), Mr. Robinson (Messrs. Robinson and Jolly, Public Accountants), and Mr. H. Russell (Department of Agriculture and Stock) were appointed to act.

Farmers' Convention—General.

Draft Orders in Council covering the election of District Councils, and generally applying the provisions of the Primary Producers' Organisation Act, including the constitution of the Council of Agriculture, was deferred to the next meeting.

In regard to a proposal for holding an annual convention of farmers, it was decided that the Director be requested to prepare a definite scheme and also an estimate of the cost involved.

The Council approved of a scheme submitted by the Director to establish, under the auspices of the Council, a regular window show in Queen street for the purpose of bringing before the public successive displays of Agricultural Products. A committee was appointed to give effect to the scheme.

It was reported that, to date, 366 Local Producers' Associations had been formed, and over 7,000 primary producers have enrolled.

DAIRYING COMMITTEE.

Metropolitan Milk Supply.

It was reported that it was the desire of the Metropolitan Milk Producers' Association to evolve a more satisfactory scheme in connection with the present handling of milk, and to that end the Milk Producers' Association had sought the aid of the Council of Agriculture. Further information, following upon a meeting of Milk Producers recently held, is awaited by the Committee.

Herd Testing.

The Council approved of the recommendation by the Committee that all Local Producers' Associations, in districts where the dairying industry is carried on, be communicated with and invited to take up Herd Testing on the basis of the existing Government scheme.

Stabilisation of Prices.

It was noted that efforts are being made by the Victorian Farmers' Union to induce the few opposing factories in Victoria to come into line with the rest of the factories throughout Australia.

Recommendations.

The Council approved of the following recommendations submitted by the Dairying Committee:—

That standard seamless containers, protected by fly-proof gauze covers, be utilised to the fullest extent, and that the several co-operative butter factories be requested to undertake the distribution of standard containers to their suppliers.

That for the purpose of protecting cream whilst held on the farm, fly-proof gauze covers for cream cans be used, and factories asked to hold supplies of these for distribution to suppliers.

That the Department of Agriculture be asked to take steps with a view to expediting the preparation of plans of standard dairy buildings, pig stys, and other appurtenances.

That in the opinion of the Council, property-owners who are themselves primary producers should not be called upon to undertake the insurance (under the Workers' Compensation Act) of share farmers or their employees engaged as tenants in work pertaining to their properties.

That the Department of Agriculture be requested to take action (possibly per medium of the Dairy Produce Act of 1920) with a view to having the vacuum tanks of milking machines rendered as sanitary as possible and fitted in such a manner as to allow the pipe service and tank to be readily taken down for cleansing purposes.

That in connection with certain resolutions recently submitted, the Harrisville Local Producers' Association be advised as follows:—

That instructions have been issued to Dairy Inspectors to confine themselves, as far as possible, to suppliers of low grade cream, but complete exemption from the operations of the Dairy Produce Act is not practicable.

That provision is made in the Dairy Produce Act for the inspection of samples of cream at the factories, and should the Association so require, the Department of Agriculture will be requested to make available, at any time, the services of an inspector for that purpose.

That it is understood an attempt recently made by the Butter Manufacturers' Association to induce Britain to impose a preferential tariff on dairy and agricultural products imported from Australia was unsuccessful, and that it is considered likely that any further attempt made by the Council would also prove abortive.

That the Railway Commissioner has advised that he will do everything possible to minimise the risk of having cream contaminated in transit over the Queensland Railways.

FRUIT COMMITTEE.

Proposed Tomato Pool.

Included in the recommendations submitted for consideration by the Council, was the proposal for establishing a Tomato Pool for the Stanthorpe district, for a period extending from about the middle of January to the middle of April, 1923. Meetings of growers had been held in many local centres in connection with the proposed pool and further meetings are to take place. The recommendation was to the effect that, providing the decision of the growers is favourable, the Director, in collaboration with members of the Administrative Committee, be authorised to make application to the Department of Agriculture for the establishment of a pool. The recommendation was agreed to.

Statistics of the Industry.

For the purpose of obtaining statistical information relating to the fruit industry, the Committee submitted a draft form of returns for the year ending 30th June, 1923. Growers would be asked to furnish the following information:—

- (a) Name of fruit.
- (b) Area under cultivation.
- (c) Total amount produced for year.
- (d) Area proposed to plant for year ended 30th June, 1924.
- (e) Estimated yield.

It was proposed that the matter of returns by growers be made compulsory, and that the Council's recommendation in favour of the proposal be submitted to the Department of Agriculture. The recommendation was approved.

Handling of Fruit.

The Committee noted that from a letter received from the Under Secretary, Department of Agriculture and Stock, it is intended to introduce legislation during next session to give effect to the recommendations of the Fruit Committee respecting this matter.

General.

In connection with the proposed amended regulations under the Diseases in Plants Act, the Fruit Committee recommended the Council's adoption of proposed amendments to Regulations No. 26, No. 27, and No. 29.

The Committee recommended, as an urgent matter, the appointment of an inspector forthwith for the purpose of inspecting, not only the New South Wales orchards adjacent to the Queensland border, but also the orchards on the Queensland side immediately adjacent to New South Wales.

It was noted that the Department of Agriculture is in a position to ascertain the commercial value of by-products of fruit and vegetables, and that there is no difficulty in the manufacture of such by-products, but the question of finding markets for the by-products when manufactured being of vital importance, the Director be asked to furnish information as to the possibility of creating markets for such products.

WHEAT AND GENERAL AGRICULTURE.

Fertilisers.

The whole question of fertilisers being of the utmost importance to primary producers, the Wheat and General Agriculture Committee have gone extensively into the matter and resolved to recommend the Council to take action. It was contended that the question of fertilisers turned upon two main points—viz., alleged unsatisfactory chemical content and high cost of fertilisers. The first aspect of the matter had been raised by Mr. T. A. Powell, a member of the Council, who had stated that it was impossible for farmers to ascertain whether fertilisers supplied to them are true to description. The second phase of the question—viz., that of high cost—was brought before the Council by the Woombye Local Producers' Association, who stated that, owing to the prohibitive cost of fertilisers, most of the farms are starved and underfed, and that fertilisers are an imperative necessity to pineapple growers. This

Association deprecated the action of the Commonwealth Government in allowing fertilisers to be exported from Australia while the need for dried blood in Queensland is urgent, and the fact that many foreign fertilisers not containing blood had been bought and used with very poor results. The report submitted stated that legislation is provided under the Queensland Fertilisers Acts of 1914 to 1916, embodying provisions for the protection of producers, but it was doubtful whether the provisions are being availed of to the fullest extent. As the Act applies merely to the sale of fertilisers by dealers in Queensland, there is possibility of its evasion by the importation of fertilisers from other States.

The report contained recommendations, which the Council approved, to the effect that the Government appoint a man of ability and experience to act as inspector of fertilisers; that the Government be asked to bring about collaboration between State Governments with a view of obtaining uniform legislation covering fertilisers; that a suggestion be made to the Department of Agriculture to redraft the regulations with a view to registration and classification of country agents, canvassers, and dealers; that a lecture be prepared, illustrated by lantern slides, for deliverance by District Agents to all Local Producers' Associations covering the whole question of fertilisers.

Proposed Arrowroot Pool.

The Director reported that he had attended a meeting of arrowroot growers at Beenleigh, on the 14th October, when it was unanimously resolved by the growers present to request that a pool, in accordance with the Primary Products Pools Act, be established for the arrowroot industry. The Committee agreed with the general principles of the scheme, and the Council decided to recommend that steps be taken to establish a pool to bring about the necessary measure of control in the hope of saving the industry.

General.

The Council noted that—The question of improving the conditions of maize growers is now receiving the personal attention of the Director, and that a report thereon will be furnished to the Council at an early date.

The question of reducing the carrying capacity of railway trucks, from 6 to 4 tons, be referred to the Transport Committee for favourable consideration.

The Director is investigating the possibility of applying the principle of co-operative distribution to Agricultural Machinery, and will furnish the Council with the result of his investigations in due course.

In connection with the resolution recently submitted by the Inverlaw Local Producers' Association, urging the Council to make the destruction of prickly-pear in infested areas a Commonwealth liability, the Federal and State Governments be requested to encourage settlers in their efforts to eradicate prickly-pear by exempting from income tax money spent for that purpose by *bonâ fide* settlers.

That the Inverlaw Local Producers' Association be advised of the action taken by the Council, and informed at the same time of the experiments being conducted by scientists under the direction of the Bureau of Commerce and Industry.

In connection with the recent suggestion received from the Moffatdale Local Producers' Association, to the effect that the Council consider the advisability of erecting a storage shed in Rockhampton for facilitating the marketing of produce, the District Agent be requested to interview the secretary and furnish the Council with full particulars as to the requirements of the Association.

In view of the statements made in a letter dated 15th ultimo from the Millman Local Producers' Association regarding the damage done to crops by wallabies, the Department of Agriculture be requested to furnish full information concerning the operations of the Dingo and Marsupial Destruction Act.

The Department be requested, at the same time, to advise as to the possibility of bringing wallabies within the scope of the Act.

THE PHYSIOGRAPHY OF NORTH AUSTRALIA—III.

By Dr. H. I. JENSEN, Geological Survey, Brisbane.

REVIEW OF INDIVIDUAL DISTRICTS—continued.

HODGKINSON-MAYTOWN BELT.

Physiography.—This area, commencing north of the Marceba-Dimbula granite mass, near the old Minnie Moxham gold mine, consists largely of very rugged and very dry country. There are few springs and no permanent waters except the perennial Mitchell River.

Slates, steeply inclined or on end, and hard felspathic greywackes, which have frequently the appearance of miarolitic trachyte and syenite, are the most plentiful rocks. They weather into rounded hillocks and steep ridges covered with a pebbly rubble which is very severe on horses' feet, giving very bad travelling. Roads in this type of country wash out badly in the wet season.

The petrography of Kingsborough and that of Maytown are almost identical, as are also the physical features, in spite of the great distance between them. The most even country in the belt are the granite areas and the larger alluvial patches.

The Hodgkinson River at and above Mulligan, and the Palmer River at and above Maytown, run in rocky gorges which contain water only in the wet season and a few months after.

Rainfall.—The average rainfall is 39.7 inches per annum at Maytown and 35.5 inches per annum at Thornborough, practically all wet-season rains.

Soils.—The soils are in general poor, though some of the slate alluvials are very fertile if only they get water enough.

Vegetation.—On the granite patches where a fair depth of soil obtains, box (*E. microtheca*), blue gums (*E. tereticornis*), and bloodwoods (*E. terminalis*) thrive. On the greywackes throughout the belt ironbark is in almost exclusive command, and becomes very monotonous to the eye. The narrow-leaved species alone was noticed in the southern portion of the belt, but at the Maytown end a lemon-scented species (*E. staigeriana*) with a more rounded leaf is very abundant as well on the white greywackes. On the alluviated flats of greywacke origin we have also *Eucalyptus alba* and *E. grandifolia*, and near permanent water pandanus and *E. papuana*.

CHILLAGOE-O.K.-PALMER BELT.

Physiography.—The scenery and vegetation of this belt is somewhat varied. The patches of Featherbed porphyry which occur, especially down the Walsh River, constitute rough, mountainous, bouldery country. The limestone areas are partly composed of well-grassed plain and partly of jagged pinnacles. The granites are very varied in chemical composition, and their scenery is accordingly varied. The greatest part of the Chillagoe granite area is an evenly eroded plain, but there are patches of hard, fine-grained, very silicious granite which resist erosion to such an extent as to survive as steep high cones whose slopes are bestrewn with huge spheroidal boulders. These hills are known as the Metal Hills, some of the earlier surveyors having mistaken this blue silicious granite for basalt or blue metal. Between the Walsh River and the Mitchell River we also have an extensive area capped with sandstone residuals, taking the form of flat-topped ranges and mesas lined with mural escarpments which are unscaleable except at a few points. These mesas and ranges are similar to Mount Mulligan. Owing to the fact that this mesa belt consists of disconnected blocks, the road from Mungana to O.K. winds through it without having to climb these ranges.

Climate.—The climate of the Chillagoe belt belongs to the semi-arid type. The average annual rainfall amounts to about 35 inches, falling in the four or five wet season months. The limestone country has but few springs, though on the whole it is better watered than the other formations, and big subartesian and well supplies are obtainable by sinking almost anywhere in the limestone. Chillagoe Creek is a permanently flowing rivulet fed by springs, but the finest stream in the peninsular part of North Queensland is undoubtedly the Mitchell River. That river, fed by springs in the coastal hills and scrub rains about Mount Molloy, is everflowing and teeming in fish.

Soils.—The alluvial and limestone soils of the belt are fairly good, but the other formation yield only poor soil. High mineralisation in the limestone formations, together with the leaching of surface soil which takes place in the heavy wet, are factors which prevent the limestones here from forming rich black loams like those of the Barkly Tableland. The limestone soils are mostly red loams in this district; they are easily tilled, and would be very productive if irrigated.

Natural Vegetation.—On the limestone country we get an abundance of calciphile trees, such as bauhinia, mimosa, corkwood, ironwood, &c., interspersed with the more

widespread species of eucalypt like *E. grandifolia*, *E. alba*, and, in damp places, *E. papuana* and *E. terminalis*. On the jagged limestone pinnacles the bottle tree, figs, and a variety of prickly bushes and vines flourish. On the granite country we have *E. grandifolia*, *E. microtheca* (box), ironwood, and *E. terminalis* (bloodwood) on the better classes of loam, while on the poorest granite soils quinine, hakea, grevillea, gardenia, *Eucalyptus setosa*, capoc (*Bombax Malabaricum*), and such like predominate, with some *E. grandifolia* interspersed. Guttapercha grows on the boulder metal hills, near Chillagoe. Pandanus, freshwater mangrove, and tea-tree are, as usual, throughout the north present in moist places irrespective of soil.

ETHERIDGE-CROYDON DISTRICT.

Physiographic.—The writer has only skimmed through this district, the geologic interest and mineral value of which justify the undivided attention of a geologist for a period of three years. It is therefore only possible to give a broad sketch and general impressions. Large areas of this district form a slightly undulating peneplain. This is the case with the granite areas. However, where metamorphic rocks predominate, rough hills and ranges are the characteristic type of scenery. That is the case on the Percy and at Gilberton.

The Newcastle Range porphyries also give rough scenery, and the later (supposed desert) sandstones yield flat-topped tablelands.

The granite and metamorphic country is badly watered. Water-boring in the granite generally yields salt water. Boring in the metamorphic country should always be carried out at or near intersections of reefs in the quadrant, which from the dip of country and reefs is best calculated to intercept the water.

Large portions of the Etheridge district are basalt-covered, especially between Fossilbrook and Einasleigh.

The basalts are very late Tertiary basalts which have flowed down river, valley, and watercourses, compelling considerable stretches of various rivers, *c.f.*, the Einasleigh and the Copperfield, to carve new valleys.

Climate.—The rainfall of the district ranges from 28 to 30 inches per annum, falling principally in January and February, and entirely in the wet season months.

Soils.—The soils are (except in the sandstone areas and limited stretches of granite slate country) of good quality. The "older granites" are of a calcic type, and yield fair soils.

Vegetation.—The forest flora of the Croydon-Etheridge granite country is more inclined to the calciphile than to the calciphobe type; this is on account of the lime-felspar content of the granite and the comparatively slight leaching of soils under the climatic and topographic conditions of these granite areas.

Thus on the "older" granites of the Etheridge we get box (*E. bicolor* and *E. microtheca*), ironwood (*Erythrophloeum*), yellow-wood, ironbark (*E. pruinosa*), gum or Moreton Bay ash (*E. grandifolia*), mimosa (*Albizia basaltica*), corkwood, and baubinia, while on the "new granites" (of Chillagoe granite age and acid character) we have quinine, hakea, gum (*E. grandifolia* chiefly), with box, tea-tree, and ironbark on the flats. On the desert sandstone of the Newcastle Range lancewood (*Acacia doraterylon*) is one of the characteristic timbers on the poor deep sandy soils, and yellow bloodwood (yellowjacket, *E. trachyphloia*) on the red loams, but with these occur *Eucalyptus grandifolia*, *E. melanophloia*, *E. leptophleba*, *E. setosa*, *E. latifolia*?, *E. calycogona* var. *gracilis*, *E. dichromophloia*, *E. pallidifolia*?, *E. ferruginea*?, *E. tetradonta*, *E. terminalis*, *E. miniata*, *E. Normantonensis*, *Acacia latifolia*, *A. holoserica*, *A. falcata*, quinine, hakea, and grevillea species.

On the porphyries about May Lagoon (Croydon road) the following trees were abundant:—*E. terminalis*, *E. miniata*, *E. pruinosa*, *E. melanophloia*, hakea, &c. The Etheridge basalts were typically clothed with box (*Eucalyptus microtheca* and *E. pruinosa*), whitewood (*Alstonia constricta*), orange (*Capparis Mitchellii*), yellow-wood (*Atalaya hemistavia*), and mimosa. In moist places on all formations *E. papuana*, *E. alba*, pandanus, tea-tree, pear, currajong (*Sterculia*), and freshwater mangrove, and by permanent waterholes the Leichhardt pine are strongly in evidence. As in the Territory, gardenias, careyas, grevilleas, and such bushes are very plentifully distributed; and the Nondah (*Parmarium nondah*) occurs at the Little River on porphyries and rolling downs.

In vegetation, physiography, and climate this district is very similar to the Northern Territory. There is no scrub country at all in this region, and agriculture would only be possible with irrigation, in spite of the good soils, since the climate is markedly semi-arid.

The grasses are nutritious, and as long as bush fires are checked the area constitutes good cattle country, but the grass seeds are too bad for sheep.

[CONCLUDED.]

SUGAR: FIELD REPORTS.

The Northern Field Assistant, Mr. E. H. Osborn, reports under date 12th October, 1922, as follows:—

Herbert River District.

The harvesting in this area is proceeding at a great rate, and with the large weekly crushing, the season's operations will finish earlier than anticipated. No industrial troubles have caused delay, and, in this respect, everything points to a very satisfactory season. The total quantity of cane harvested will be under the earlier estimates, as a consequence of the very dry and cold weather experienced recently. Autumn plant cane is backward, and ratoons are also very light. Young plant cane also shows the effect of the dry weather. The varieties grown on the Herbert are principally Badila and H.Q. 426 (Clark's Seedling), with lesser quantities of H.Q. 409, Black Innis, Gorn, Korpi, Nanemo, Oramboo, and varieties from the Sugar Experiment Stations, such as Q. 813, E.K. 1, E.K. 28, Q. 903, Q. 1121, Tableland Badila, and D. 1135.

The largest area of the lastnamed was a 7-acre block of June plant on Mr. J. Coomba's farm at Hawkin's Creek. It is the result of seed obtained from the Bundaberg Experiment Station last year, and certainly has made a fine strike, particularly at a time when the average strike of cane has been bad. It is growing upon some medium forest land, and Mr. Coomba intends trying it upon an area that is generally grub affected. Another of the newer varieties seen is Q. 813. Mr. Blackburn, of Macknade, has a paddock of this cane, planted last May, on a medium to poor soil. It looks remarkably green and healthy and has also struck splendidly. Mr. Blackburn is now cutting a 12-acre paddock of plant cane, consisting of Badila, H. Q. 409, and Q. 813. Of these three varieties, the lastnamed is easily the best for tonnage. Although the Q. 813 has arrowed slightly, the H.Q. 409 is a mass of arrows which developed much earlier than the former. Nearby, a small patch of Volunteered Q. 813 is cutting with good results, and the ratoons from it are already looking well, despite the dry weather. Out of a variety of canes planted in a paddock by Mr. W. J. Enticknap, consisting of Q. 813, E.K. 1, E.K. 2, E.K. 28, Q. 903, H. 109, and M.Q. 1 (Mowbray Seedling), the Q. 813 is easily the best. This particular paddock is only of average forest soil quality. Tractor power on the Herbert River is becoming more popular every year. Mr. E. J. Glover, of Hawkins Creek, has just completed a paddock, which he drilled, planted, and manured in one operation at the rate of 5 acres per day with a man each on the tractor and planter. This grower also planned to give a 32-acre block its first ploughing in four and a-half days with a 4-disc plough drawn by the same tractor.

Pests and Parasites.—The rat pest has been very severe upon the river this year. The Colonial Sugar Refining Company is going to a great deal of trouble supplying poison baits to farmers, but many farmers are lax in making the best of this opportunity. As, probably, these same growers are losing heavily from the pest, it is hard to understand their attitude in not seconding the company's efforts. Grubs have also done a certain amount of damage in places, and the collection of beetles in the worst affected places is to be renewed. Borers are very prevalent, and the Sugar Bureau's entomologist intends liberating tachinid flies in the most suitable area. In this matter, the Colonial Sugar Refining Company's officials are also doing very good work upon similar lines.

Gumming Disease.—This disease is causing a certain amount of anxiety to the local growers, as this year a large and scattered area is affected by it. The cane to which it is subject is mainly Clark's Seedling (H.Q. 426), although Badila is also affected to a slighter extent. As there is a very large proportion of this H.Q. 426 cane grown upon the Herbert, the seriousness of the situation is easily understood. In view of the foregoing, very many inquiries are being made for a cane less susceptible to the disease. The practice of planting whole sticks of cane in the drills and then chopping them through with a cane knife is condemned, for through these methods it is impossible to detect either gum-affected cane or that suffering from borer attack.

Goondi, Mourilyan, and South Johnstone.

The conditions in these areas was found to be somewhat better than those on the Herbert, as $1\frac{1}{2}$ inches of rain had fallen in August and a further 1.99 inches in September. The cold weather experienced further south had also made itself felt in these areas, and both the cane now being harvested and recently planted cane were affected. The tonnage to be harvested under such conditions will naturally be under the earlier estimates. The density figures are very good. A short visit was made to Cowley (Liverpool Creek) where some good cane was seen. Among the farms visited was that of Mr. J. McCutcheon, who has some 120 acres under cane. The soil is of a fairly stiff, clayey alluvial, and gives some very good yields per acre. Mr. McCutcheon ratoons deeply, uses the skeleton plough to burst up the middles, and later on follows with a heavy grubber going 12 or 14 inches deep. He also uses green manure, preferably beans. In the South Johnstone district proper, the area that looked most forward was in the neighbourhood of No. 2 branch. The ratoons cut recently looked very fair, as did also some May and June plant. A large area of this particular part of the district is now being put under the plough. The Japoon area seen was disappointing; the cane does not seem to have made much growth since early in the year; the young plant cane is also backward. A large acreage of this land has been grubbed ready for ploughing, and quite a large acreage has been planted. Rain is badly needed, both for the recently cut ratoons and the young plant.

Soldiers' Settlement.

This settlement has progressed rapidly since my last visit. Some seventy-seven settlers are delivering cane this year, of whom about forty are upon their blocks. The cane being cut is mostly standover Badila of a very good formation, and is probably the best class of cane going into the mill. The dry weather conditions have also been felt here, and the crops are backward. Horse tramlines connecting the farms with the derricks (three in number) have been laid down in central places, and harvesting is in full swing. A school has been opened in the township, and quite a number of very neat homes are to be seen upon the holdings. The block holders are a fine type of hard-working men and are determined to make good.

Banyan and Tully.

During a short visit paid to these areas, a large amount of good cane land was seen. The land ridden over was mostly a grey alluvial capable of growing heavy crops of cane. Owing to the uncertainty of being able to dispose of cane, only a few farmers have planted, but the samples seen of Badila were of a very good quality, while a few stools of M. 1900, upon Mr. Deane's farm, looked very good, too. Just now, much interest is being taken by the residents in the question of a mill for this rich district, as they recognise that, with a sugar factory in operation and a through line to Townsville, the potentialities of this splendid sugar-growing area must be recognised.

The Southern Field Assistant, Mr. J. C. Murray, reports under date 4th October, 1922, as follows:—

Beenleigh.

Renewed interest in sugar production is being taken in this district. Growers are increasing their acreages under cane, and taking a greater interest in varieties that are likely to give better c.e.s. results than those hitherto raised on Beenleigh areas. This is an important matter both for the sugar-mills and the farmers. The producers of sugar should gradually eliminate the old and more susceptible varieties to disease from their farms, and gradually work in such useful canes as E.K. 1, Q. 813, Q. 970, and Q. 1098. Such canes as D. 1135, Badila, M. 1900 Seedling, and Malagache, which are already fairly extensively planted, should be retained. The farmers here are advised to lime as much as possible on the heavier soils, also grow maize as a green manure and rotation crop for sugar-cane. They are also recommended not to cover their plants too heavily with earth, and regard early spring as the best time to plant. Farmers are also recommended to make full use of the facilities provided by the Bureau for getting soil analysed as a basis for fertilisation. A small number of progressive men with fertiliser testing plots on typical soils are always of great value to a cane district. The Beenleigh District Show was a great success this year, the cane exhibit being especially good. Much interest was also taken in the cane exhibits of the Bureau of Sugar Experiment Stations (non-competitive) and the Department of Agriculture and Stock's cotton and maize exhibits. The farmers are pleased with the interest taken by the above authorities, and would like it repeated next year.

Woongarra.

Very fair crops are being cut in the Woongarra district; in fact, much better than was originally expected after the prolonged dry spell following the Christmas rain. Most of the cane for next year's crop is in good condition, the young ratoons and plant cane making a good showing. Varieties looking well are M. 1900, Q. 813, H.Q. 285, Badila, and Shahjahanpur No. 10. Good cultivation is in evidence on most farms, although some growers, through lack of facilities, are not ploughing deeply enough. The Hummock Plantation, probably, takes the lead in thorough cultivation on a large scale, the results obtained being largely due to this practice. Taking all the lessons of the past into consideration, it is likely that, if the growers of cane could get down deeply into the soil (not necessarily invert it), the danger of dry weather would be greatly minimised. The greater use of disc harrows is recommended. There is a good deal of dissatisfaction regarding the price of motor tractors. Owing to matters over which the farmer has no control, the price for them is excessive compared with what the primary producers have to pay in countries from whence they come. More than the average amount of horse power is necessary for many of the sugar-growers to properly work their fields nowadays, hence the difficulty the small man has in keeping pace with his more financial brother.

Barolin.

This portion of the Bundaberg district is cutting out well. The cane is ratooning satisfactorily, and the plant crop (early Spring) presents a good strike. Provided an ordinary immunity from frost, and an average rainfall is experienced, the crop next year should be a good one. Cane varieties giving very satisfactory returns are Shahjahanpur No. 10, Q. 813, D. 1135, and M. 1900 Seedling. Several growers are particularly pleased with the results obtained from Shahjahanpur. This variety is cutting with a high c.e.s. and has shown a marked resistance to frost, and gives fair tonnages per acre. Land is being cleared and planted with this cane at S. Kalkie at the present time. On this Barolin land, good results are obtained by the use of bonedust, from 3 to 5 cwt. per acre. The growers here are recommended to practice as much local experiment, relative to guiding them in the use of chemical fertilisers, as possible; also to submit soils for analyses to the Bureau. Farmers are also requested to tabulate the results of any experiments they may make and keep records of the behaviour of cane varieties. This is always valuable information to the agricultural community.

Gooburrum.

Probably, some of the best crops in the Bundaberg district this season are coming from the Gooburrum area, particularly the D. 1135 and the M. 1900 Seedling. Next year's prospects, so far, are also good. The cane is ratooning vigorously, while the young plant cane looks very healthy. Very little is left to be desired in regard to cultivation. Considerable quantities of filter press cake have been used on this land in the past, accounting in a large measure for the improved texture of soil. Other cane varieties, besides those mentioned above, making a good showing are E.K. 1, E.K. 2, E.K. 28, J. 247, H.Q. 285, and Q. 1098. Regarding manurial results, growers have found the turning in of Mauritius bean beneficial, also the use of a fertiliser known as Mt. Etna. Average c.e.s. returns from the staple variety (D. 1135) have been about 13 per cent. No marked evidence of deterioration by disease is traceable in the cane at present.

Sharon.

Farmers are taking off satisfactory crops in this area, while the young plant crop and ratoons look well. No setbacks are being experienced so far by grubs or borer attack, nor is there marked evidence of bacteria agencies or root destroying fungi. Varieties making a good showing are Q. 813, Malagache, D. 1135, N.G. 16, Shahjahanpur No. 10, Q. 77, Badila, B. 208, M. 1900 Seedling, N.G. 24, A. and H.Q. 285. N.G. 15 has given the best c.e.s. results, so far, with averages of 15.5 per cent. Growers in this area are recommended to use lime as much as possible, on the more tenacious soils, with a view to improved texture.

Oakwood.

The growers here are carrying on with good results. The whole plantation presents a well-farmed appearance, and the farmers are taking off satisfactory crops. The cane here, also, is ratooning well, and the plant crop is making headway. Varieties outstanding at present are the D. 1135, M. 1900 Seedling, and Q.813. Some of the growers are introducing Malagache which, judging by stools already growing, should do fairly well. Farmers are recommended to green manure as much as possible, and keep the soil in a sweet condition by occasional applications of lime. As there are a number of very progressive farmers both here and in the Gooburrum district, they are requested to tabulate any information they may have on fertilising and cane varieties, with a view to this being of benefit to the community.

Bucca.

This area presents a more extensively cultivated appearance than it has done for some years. The farmers are taking off their crops, although the dry weather after the midsummer rains gave the cane a serious setback. However, if most of the farmers get a good season next year, they will be on their feet. Cutting, ratooning, and farming operations generally were in full swing at the time of visiting, and fresh land was being planted, or, at least, land that had been out of cane for a number of years. Cane varieties at present doing well include Shahjahanpur No. 10, Q. 813, E.K. 1, Q. 1098, and D. 1135. All the first four mentioned should do well, and the farmers are recommended to give them a fair trial. Farmers at present are not greatly affected by destructive parasites or fungoid agencies. The use of lime over a large area would be beneficial at present.

Avondale (Moorlands).

On these river soils the cane is making a very fair showing, particularly the D. 1135, H.Q. 285, and M. 1900 Seedling. The H.Q. 285 is a cane that is being widely distributed at present on account of its early maturing properties, and is a good variety to plant with M. 1900 Seedling on that account. Mr. Scotney, senr., of Moorlands, has sent a considerable tonnage of this cane to various cane areas for planting. Other canes that the growers are recommended to try here are Shahjahanpur No. 10, E.K. 1, and Q. 970.

Bingera.

Crushing is now in full swing here. The cane coming to the mill is healthy and of good length. One stick of M. 1900 Seedling grown on the plantation was 8 feet 3 inches long and weighed 15 lb. Another variety, B. 156, yielded 63½ tons to the acre, with a c.e.s. value of 12.06. The best fertilising results are being obtained at present from the use of basic superphosphate and "Three sevens." As a green manure, cowpea is extensively used. Cane varieties doing well on the farms are Q. 813, E.K. 1, M. 1900, and D. 1135. Rain is now wanted on the Bingera areas. However, the young plant crop looks well, and the ratoons are coming away vigorously. No sign of serious disease is in evidence, nor any marked grub infestation.

Gin Gin.

Although the long spell of dry weather militated seriously against the chance of cutting a big crop, the returns from the Gin Gin areas this year are going to be very fair. The farming is all of a high standard, and the growers are keen on raising the best cane available. Since the subdivision of the Watawa plantation, several new farmers have started on these lands and are doing well. Rain is wanted at present, but, nevertheless, the young crop is healthy and growing well. Cutting was in full swing at the time of visiting this area, consequently each farmer was working at full pressure to get his crop cut. A cane variety making a good showing on both the red soils and the Maroondan black soils is M. 1900 Seedling, a cane coming more and more into favour. The farmers are also contemplating an increased area of H.Q. 285, as recommended in previous reports. Growers are advised to discourage the burning of cane as much as possible and to plant maize and cowpea as rotation and green manure crops. Lime is essential on the black soils at Maroondan.

In all the districts under review, labour trouble is at a minimum, harvesting going with a swing. There is an excellent class of field worker in the south this season.

FRUIT FLY INVESTIGATIONS.

The Minister for Agriculture and Stock (Hon. W. N. Gillies), has made available the following report for the month of September from the Entomologist (Mr. Hubert Jarvis), stationed at Stanthorpe.

WINTERING OF FRUIT FLY.

Some time has been spent continuing the effort to discover, if practicable, any indication of the fruit fly (*B. tryoni*), wintering in the soil in the pupal form. Thus, at the Summit, search was made in and under a packing shed where a large quantity of late apples had been stored. No living fruit fly pupæ were, however, met with here.

In the Ballandean district, also, a dump was visited where 2,000 cases of fruit fly infested apples had been deposited; careful sieving of the soil under and around this dump failed to bring to light any fruit fly pupæ—empty or unhatched. When the number of maggots which must have been present in so large a quantity of infested fruit is taken into account, the total absence of fruit fly puparia in such a situation—200 feet below Stanthorpe—seems to further indicate the non-wintering in the soil of the fruit fly (*B. tryoni*), in the Granite Belt.

Again, in the Ballandean district, a dump was examined where fly-infested fruit had been buried 18 inches to 2 feet deep in the orchard. This fruit (principally late peaches) on being dug up was found to be in a more or less rotting condition, although individual fruits were still in part quite firm. A careful search in this fruit and in the surrounding soil failed to reveal any fruit fly maggots or pupæ, in spite of the fact that large numbers of fruit fly maggots must have been originally present, as was evidenced by the numerous tracks and borings still visible in the fruit and fruit pulp. Probably the fermentation of the fruit was a factor contributing to the destruction of the maggots.

FRUIT FLY IN PACKING SHEDS.

On examination of the two fruit fly pupæ found in Mr. D. Pfunder's shed, both were found to be dead; in one case dried up internally, and in the other full of decomposing liquid. I might mention here that the finding of these two pupæ in no way implies any carelessness on Mr. Pfunder's part, nor reflects in any way on his admirably cultivated and well cared for orchard. Fruit fly pupæ (empty cases) can be found in and under almost any shed in the Granite Belt where fly-infested fruit has been stored. Rather was it my intention to assemble evidence to prove that the fruit fly does not winter in the pupal form in this district, but is a seasonal visitor from lower altitudes.

THE ADULT FRUIT FLY.

A watch, such as is possible, is being kept on all native and cultivated trees and shrubs for any sign of the adult or mature fruit fly.

Fruit flies, in common with most Diptera (two winged flies), must, to sustain life, have access to some more or less liquid nectar; this want is, in nature, abundantly supplied by numerous flowers; the nectar they contain being more plentiful in the morning before the sun has had time to dry the dew from the blossoms.

Although daily increasing numbers of Diptera are now on the wing, and can be observed visiting the numerous flowering trees and plants, no fruit flies have, so far, been noted. Should this insect hibernate as a fly, it is only reasonable to conclude that the warm, genial weather now being experienced in this district would tempt at least some specimens to break their long winter fast.

Fly lures placed in various parts of the district have also failed, so far, to attract a single specimen of the Queensland fruit fly (*B. tryoni*).

An early visit to Warwick and Toowoomba districts is contemplated, with a view to determining, if possible, the nearest point to the Granite Belt at which the fruit fly is to be found:—(1) *Wintering in the soil in the pupal form*; presuming that this is its native habit (as is stated by Mr. W. W. Froggatt, Government Entomologist, New South Wales); or (2) *Overwintering as an adult fly*, a possibility favoured by the Entomologist in Chief, Mr. H. Tryon. Definite information on this point would prove of much interest and value. Possibly we shall have to go below the Darling Downs before finding our objective.

RED MITE (*BRYOBIA* Sp.).

This mite (in evidence in the egg form on the trees in many orchards) is now hatching out. Oil sprays used during the winter on these eggs, although killing a good number, have not proved a complete control; on the living mites, however, oil sprays (red oil; 30 water) should prove quite satisfactory. The lime-sulphur and arsenate sprays now soon to be used by orchardists for woolly aphis and Codlin moth, respectively, should also be beneficial in helping to control *Bryobia* mite.

VINE INJURIOUS INSECTS.

An instance of a species of *Cicada* ovipositing in grape vine wood was brought to my notice by Mr. A. E. Sewell, of Applethorpe. This is probably one of our small *Cicadas* (*Melampsalta* sp.), and it is to my knowledge the first instance of a *Cicada* ovipositing in the vine.

By the same source, another vine insect also was received (a borer), the larval or caterpillar form of a *Xylaryetid* moth.

I do not think that either of these insects is likely to prove a pest of economic importance; but growers cannot do better than to emulate the good example of Mr. Sewell, thus keeping a sharp lookout among the vines for any sign of sickness or of insect damage.

Visits of inspection have been made to the following districts:—The Summit, Applethorpe, Diamond Vale, Ballandean, and Eukey.

SPRAYING EXPERIMENTS.

Some time has been devoted to the testing of the possible efficacy of various sprays for peach aphis (*Myzocera*), but no satisfactory results have been so far obtained.

The control of the woolly aphis occurring on the roots of apple trees will, it is proposed, shortly be attempted; a machine for injecting liquids into the soil having been kindly loaned to the office by Mr. W. F. Barnard, of Applethorpe.

HOME TANNING—I.*

Numerous requests have reached the Department of Agriculture and Stock for directions for tanning hides on a small scale. Usually the tanning of a few hides or skins by inexperienced persons or those lacking adequate facilities cannot be recommended from the view point either of national economy or of individual profit. Sometimes, however, circumstances arise when a knowledge of tanning is of particular value on the farm. From time to time various methods of tanning have been described in the Journal. The latest information, containing possibly some new ideas, we have embodied in D.C. 230 of the U.S. Department of Agriculture on "Home Tanning," issued in July of this year, and from which the following notes are abstracted. A second instalment will be published in the next issue.—Ed.

Although good serviceable leather has been made in the Bureau of Chemistry, with the equipment and directions here described, the inexperienced operator will probably often be unsuccessful. Every attempt, however, through close observation and experimenting, should add to his experience and reduce the number of his failures. Operating on a small scale, he can not hope to obtain leather equal in appearance and possibly quality to that on the market, but he should be able to obtain leather of service for many purposes on the farm. It will also probably be found necessary at times to modify these directions, especially as to equipment, to suit conditions or in tanning other kinds of leather. Success in this will depend largely upon the experience and ingenuity of the individual.

General Information.

Complete directions are given in this circular under each method of tanning described. This results in repeating the description of some operations which are common to nearly all methods of tanning, but the repetition is necessary to avoid the confusion that otherwise would result from disconnected directions. The details essential in explaining the numerous steps should not prove confusing. The directions need not, of course, be memorised, but they should be carefully studied until they are thoroughly understood before the operation is begun. All supplies and equipment should be obtained and plans should be fully made before beginning the work.

Unless otherwise specified, tanning operations are best done at a uniformly moderate temperature. For convenience there should be a handy supply of fresh water and also a drain. All the operations can be done in tight, clean wooden barrels, of 40 to 60 gallons capacity. When not in use the barrels should be kept clean and full of water. Half barrels and wooden buckets and tubs are very convenient for many purposes. Iron containers should never be used.

Hides and Skins.

The hide or skin may be started in process as soon as it has been taken-off, drained, and cooled from the animal heat. Overnight will be long enough. If you are not ready to begin tanning, or if you have at one time more hides than you can handle, they can be kept safely for three to five months in a thoroughly salted condition. During storage or tanning the hides must never be allowed to freeze or heat. Some tanners claim that salting before tanning is helpful, and it will certainly not do any harm to salt the hide for a few days before tanning.

The kind of leather which can be made from a hide or skin depends largely upon its weight and size. The tanning trade makes distinctions in hides and skins based mainly upon the size and age of the animal and upon the class of leather. Hides from the larger and adult animals are suitable for sole, harness, belting or heavy leathers. Skins from the smaller animals, such as sheep, goats, calves, and deer, are made into light and fancy leathers. While there are other commercially important sources of hides and skins, the most important ones, with the exception of furs, are the usual domesticated farm and range animals. As a general rule, the thickness of the finished leather will be about that of the untanned hide, and this should be a guide in selecting skins for different kinds of leather.

The first essential for a satisfactory yield of good leather is a good, sound, clean hide or skin. Skinning should be done properly, without cutting or scoring the hide, at the same time leaving on it no fat and meat, which must be removed later before tanning and which, if left on, increases the chances of spoiling or rotting the hide.

Bark-tanned Sole and Harness Leather.

Read the directions through before starting this work.

These directions have been prepared for tanning a single heavy cow, steer, or bull hide, weighing from 40 to 70 lb., into bark-tanned leather suitable for sole, harness, or belting.

* Department Circular 230, by R. W. Frey, I. D. Clarke, and F. P. Veitch, Bureau of Chemistry, United States Department of Agriculture (July 1922).

Slaking Lime.

Put 6 to 8 lb. of burnt or caustic lime in a clean half barrel, wooden tub, or bucket, of at least 5 gallons capacity. Use only good-quality lime, free from dirt and stones and never air-slaked. To the lime add about 1 quart of water. As the slaking begins, add more water, a little at a time, to keep the lime moist; do not pour in water enough to quench the slaking. After the lime appears to be slaked, stir in 2 gallons of clean water. Do all this just exactly as you would make white-wash. Slake the lime on the day before you start soaking the hide, and keep the lime-water covered with boards or sacks until ready for use.

If available, fresh hydrated lime, not air-slaked, may be used instead of slaking burnt or caustic lime. In this case use 8 to 10 lb. in 4 or 5 gallons of water.

Soaking and Cleaning.

If the hide has been salted, shake it vigorously to remove most of the salt. Spread it out, hair side down, and trim off the tail, head, ears, all ragged edges, and shanks.

Place the hide, hair side up, lengthwise, over a smooth log or board; and, with a sharp knife, split from neck to tail, straight down the backbone line, into two half hides, or "sides." It will be more convenient in subsequent handling, especially when the hide is large, to then split each side lengthwise through the "break," just above the flanks, into two strips, making the strip with the backbone edge about twice as wide as the belly strip. Thus a whole hide will give two sides or four strips. In these directions the "side" should be taken to mean either side or strip, as the case may be.

Fill a 50-gallon barrel with clean, cool water. Hang the sides, flesh out, over short sticks and suspend them in the barrel of water to soak for two or three hours. Stir them about frequently to soften, loosen, and wash out the blood, dirt, manure, and salt. (The short sticks or pieces of rope may be held in the proper position by tying a loop or cord on each end and catching the loops over nails in the outside of the barrel near the top.) After soaking for about three hours, take out the sides, one at a time, and place them, hair side up, over a "beam." (A ready-made beam can be purchased, but a fairly satisfactory one can be made from a very smooth slab, log, or thick planed board from 1 to 2 ft. wide and 6 to 8 ft. long. The slab or log is inclined, with one end resting on the ground and the other extending over a box or trestle so as to be about waist high.) With the side lying hair side up over the beam, scrub off all dirt and manure, using, if necessary, a good stiff brush; then wash off with several bucketfuls of clean water.

Now turn the side over, flesh side up, and scrape or cut off any meat or flesh. Work over the entire flesh side with the back edge of a drawing or butcher knife, held firmly by both ends while pushing away from you hard against the hide or skin. Wash off with a bucket or two of clean water. This working over should always be done. Refill the soak barrel with clean, cool water and hang the sides in it as before, working them about frequently until they are soft and flexible. A green or fresh hide usually needs to be soaked for not more than twelve or fourteen hours; a green salted hide for not more than twenty-four to forty-eight hours.

When the sides are properly softened throw them over the beam and thoroughly scrape off all remaining flesh, fat, or meat. It is of the greatest importance to remove all this meat. When it cannot be scraped off, cut it off, but be careful not to cut into the hide itself. Even should there appear to be no flesh to take off and nothing appears to be removed, it is necessary to thoroughly work over the flesh side in this way with the back of a knife. Finally, wash off with a bucketful of clean water.

The hide must be soft, pliable, and clean all over before being put into the lime.

Liming to Remove the Hair.

Wash out the soak barrel and pour into it all of the slaked lime. Nearly fill the barrel with clean, cool water, and stir thoroughly. Hang the sides or strips again over the short sticks or pieces of rope, hair side out, and suspend them in the barrel so that they are completely covered by the lime water. See that the sides are suspended with as few folds or wrinkles as possible and also be sure not to trap any air under the sides. Keep the barrel covered. Plunge the hides and stir the lime-water three or four times each day until the hair will come off easily. This will take from six to ten days in summer, and possibly as many as sixteen days in winter. When thoroughly limed the hair can be rubbed off readily with the hand. Early in the liming process it will be possible to pull out the hair, but the hide must be left

in the lime until the hair comes off by rubbing over with the hand. For harness and belting leathers leave the hide in the limes for three to five days after this condition has been reached.

When limed, throw the side, hair side up, over the beam, and, with the back edge of a drawing or butcher knife, held nearly flat against the hide, push off the hair from all parts of the hide. If the side is sufficiently limed, a curdy or cheesy layer of skin rubs off with the hair. If this layer does not rub off, the side must be returned to the limewater. After removing the hair, put the side back again for another day, until any fine hairs that may remain can be easily scraped off. Now thoroughly work over the grain or hair side with a dull-edged tool to "scud" or work out as much lime, fat, and dirt as possible. Then turn the side over and do the same thing, being sure to remove all fleshy matter. Shave down to the hide itself by scraping or by using a very sharp knife with a motion somewhat like that of shaving your face. Rinse off both sides of the hide with clean water. Wash the hide in cool, clean water for six to eight hours, changing the water frequently, and then proceed as under "Deliming."

The lime, limewater, sludge, and fleshings from the liming process may be used as fertiliser, being particularly good for acid soils. The hair, as it is scraped from the hide, may be collected separately, and, after being rinsed several times, may be used in plastering. If desired, it can be thoroughly washed with many changes of water until absolutely clean and, after drying out in a warm place, can be used for padding, upholstering, insulation of pipes, &c.

Deliming.

Buy 3 oz. of U.S.P. lactic acid (or 9 oz. of tannery 22 per cent. lactic acid). Nearly fill a barrel with clean, cool water and stir in the lactic acid. Now hang in the un haired sides or strips. Pull them up, and stir frequently for about twenty-four hours. Take out the sides, work over, "scud" them thoroughly as directed under "Liming," and hang them in a barrel of cool water. Change the water several times, and finally leave them in the water overnight.

If lactic acid cannot be obtained, use one-half gallon of vinegar instead.

Tanning.

The hide or sides are now ready for the actual tanning. From fifteen to twenty days before this stage is reached weigh out 30 to 40 lb. of good-quality, finely-ground oak or hemlock bark and pour on to it about 20 gallons of boiling water. (Finely-ground bark, with no particles larger than a grain of corn, will give the best results. Simply chopping the bark into coarse pieces will not do. Do not let the tan liquor come in contact with iron vessels. Use the purest water available. Rain water is best.) Let this bark infusion stand in a covered vessel until ready to use. Stir it up occasionally. When ready to start tanning, strain off the bark liquor through a clean, very coarse sack into the tanning barrel. Fill the barrel about three-fourths full with water, rinsing the bark with this water so as to get out as much tannin as possible. Add two quarts of vinegar. Stir well. Hang the sides or strips, from the deliming, over sticks, and suspend them in this tanning liquor with as few folds and wrinkles as possible. Move the sides about and change their position often so as to get an even colour. Just as soon as this has been started, weigh out the same quantity of ground bark and soak it with hot water as before. Let this second bark liquor stand until the sides have become evenly coloured, or for from ten to fifteen days. Then add one-fourth of the second bark liquor, taking out from the tanning barrel first the same amount of old liquor as you are going to add of the new or second bark liquor. Also add about 2 quarts more of vinegar and stir it in well. After five days add another fourth of the tan liquor only (no vinegar); do this every five days until the liquor is used up.

About thirty-five days after the actual tanning has been started, the sides are ready for the first bark. (The progress of the tanning varies somewhat with conditions and can best be told by inspecting a small sliver cut from the edge of the hide. The fresh cut should show two somewhat dark or brown streaks coming in from each surface of the hide. These streaks will be rather narrow, about as wide as a heavy pencil line.) Weigh out about 40 lb. of fine bark and just moisten it with hot water. Do not add more water than the bark will soak up. Pull the sides out of the tan liquor and dump in the moistened bark, keeping as much of the old-tan liquor in the barrel as possible. Mix thoroughly, and while mixing hang the sides back in the barrel. Actually bury them in the bark; all parts of the sides must be kept well down in the bark mixture. Leave the sides in this bark for about six weeks, moving them about once in a while.

After six weeks pull the sides out (a cutting should show that the tanning has spread nearer to the centre); pour out about half the liquor. Stir the bark in the

barrel, hang the sides back, and fill the barrel with fresh finely-ground bark. Leave the sides in for about two months, shaking the barrel from time to time, and adding bark and water as needed to keep the sides completely covered.

At the end of this time the hide should be evenly coloured all the way through, without any white or raw streak in the centre of a cut edge. If it is not struck through it must be left longer in the wet bark and more bark may be necessary. For harness, strap, and belting leather the sides may be taken out of the tan liquor at this stage, but for sole leather they must be left for two months longer. When fully tanned through the sides are ready for finishing.

Finishing.

Harness and Belting Leather.—Take the sides from the tan liquor, rinse them off with water, and scour the grain side with plenty of warm water and a stiff brush. This must be very thoroughly done until most of the tan liquor and water has been rubbed or pressed out. Then go over the sides with a "slicker," working them out on the grain side in all directions. (A slicker can be made from a piece of copper or brass, about one-fourth inch thick, 6 inches long, and 4 inches wide. One long edge of the slicker is mounted in a wooden handle, and the other long edge, well rounded, is used to work over the sides by pushing hard against them and away from yourself.) For harness, belting, and the like this scouring and slicking out must be thoroughly done. When the sides are still damp, but not very wet, go over the grain side with a liberal coating of neat's-foot or cod oil. Hang up the sides and let them dry out slowly. When dry, take them down and dampen them well by dipping in water or rolling up in wet sacking or burlap. When uniformly damp and limber, evenly brush or mop over the grain side with a thick coating of a dubbin made by melting together about equal parts of cod oil and tallow or neat's-foot oil and tallow. When cool, this dubbin must be soft and pasty, but not liquid, and it must be melted before using and applied warm. Hang up the sides again and leave until thoroughly dried. When dry, remove the tallow from the grain by working over with the slicker. If more grease in the leather is desired, dampen back and apply another coating of the dubbin, giving a light application also to the flesh side. When again dry remove the tallow. Rubbing over with sawdust will help to take up any surface oiliness.

If it is desired to blacken the leather, this must be done before greasing. A black dye solution can be made by dissolving one-half ounce of water-soluble nigrosine in $1\frac{1}{2}$ pints of water, with the addition, if handy, of several drops of ammonia. Evenly mop or brush this solution over the dampened but ungreased leather, and then grease as directed in the preceding paragraph.

Sole Leather.—Take the sides from the tan liquor and rinse them off thoroughly with clean water. Press out most of the water, and hang them up until they are only damp; then apply a good coating of neat's-foot or cod oil to the grain side. Again hang up until thoroughly dry.

When repairing shoes with this leather it is advisable, after cutting out the piece for soles, to dampen and hammer it down well, and then, after putting it on the shoe, to make it waterproof and more serviceable by setting the shoe for about fifteen minutes in a shallow pan of melted grease or oil. The grease or oil must not be hotter than the hand can bear. Any good oil or grease will do, and the following simple formulas have been found to be satisfactory:—

Formula 1:—							Ounces.
Neutral wool grease	..	..	..	..	..	..	8
Dark petrolatum	..	..	..	..	..	..	4
Paraffin wax	..	..	..	..	..	..	4
Formula 2:—							
Petrolatum	..	..	..	..	..	..	16
Beeswax	..	..	..	..	..	..	2
Formula 3:—							
Petrolatum	..	..	..	..	..	..	8
Paraffin wax	..	..	..	..	..	..	4
Wool grease	..	..	..	..	..	..	4
Crude turpentine gum (gum thus)	..	..	..	..	..	..	2
Formula 4:—							
Tallow	..	..	..	..	..	..	12
Cod oil	..	..	..	..	..	..	4

(In the next issue the chrome process of tanning will be described.)

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, SEPTEMBER, 1922.

The results for the month of September were, on the whole, fairly satisfactory. In the light section, Mr. C. H. Singer's White Leghorns topped the score with 168 eggs, closely followed by Mr. N. A. Singer with 167; the latter's D. bird has put up a fine unfinished run of 40 eggs. This bird is a fine layer and a good worker. In the heavy breeds Mr. R. Burns leads for the month with 157 eggs, the second place being taken by Mr. W. Becker's Langshans. Two deaths occurred in the course of September. Some trouble was experienced with broodies in the course of the month. Following are the individual records:—

Competitors.	Breed.	Sept.	Total.
LIGHT BREEDS.			
*N. A. Singer	White Leghorns ...	167	747
C. H. Singer	Do.	168	716
W. and G. W. Hindes	Do.	139	685
*Bathurst Poultry Farm	Do.	135	623
*T. Fanning	Do.	139	594
*W. A. Wilson	Do.	126	585
J. H. Jones	Do.	130	583
*G. Trapp	Do.	129	582
*Mrs. L. Andersen	Do.	136	581
*S. L. Grenier	Do.	134	577
*B. Gill	Do.	146	574
*J. M. Manton	Do.	149	572
A. G. C. Wenck	Do.	129	569
*W. Becker	Do.	137	564
*H. P. Clarke	Do.	133	555
*G. Williams	Do.	125	540
*J. W. Newton	Do.	138	540
*R. C. Cole	Do.	137	532
*O. Goos	Do.	116	531
*C. Goos	Do.	138	521
B. Hawkins	Do.	104	521
*Oakleigh Poultry Farm	Do.	142	511
*H. Fraser	Do.	125	510
J. Purnell	Do.	100	510
*Mrs. R. Hodge	Do.	145	509
A. Maslin	Do.	104	506
*J. W. Short	Do.	131	487
*Mrs. E. White	Do.	113	482
*Thos. Taylor	Do.	128	477
T. H. Craig	Do.	119	476
*C. M. Pickering	Do.	133	473
*R. C. J. Turner	Do.	133	472
*M. F. Newberry	Do.	121	472
N. J. Nairn	Do.	129	467
E. Stephenson	Do.	119	450
G. F. Richardson	Do.	105	448
*F. Birchall	Do.	115	448
*E. A. Smith	Do.	124	445
E. Symons	Do.	120	437
B. C. Bartlem	Do.	114	434
A. Anders	Do.	111	393
Brampton Poultry Farm	Do.	104	375
H. Trappett	Do.	128	369
Parisian Poultry Farm	Brown Leghorns ...	110	220

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	August.	Total.
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	157	650
*A. E. Walters	Do.	133	646
*T. Hindley	Do.	131	604
*H. M. Chaille	Do.	123	596
*R. Holmes	Do.	112	593
Mrs. A. Kent	Do.	110	563
Jas. Hutton	Do.	101	556
Wambo Poultry Farm	Do.	121	550
*C. C. Dennis	Do.	141	545
*E. F. Dennis	Do.	118	515
Mrs. A. E. Gallagher	Do.	124	519
*Jas. Potter	Do.	110	495
R. Innes	Do.	122	489
*Rev. A. McAllister	Do.	93	470
Mrs. L. Maund	Do.	113	469
V. J. Rye	Do.	105	452
W. Becker	Chinese Langshans ...	145	447
H. B. Stephens	Black Orpingtons ...	129	442
*Parisian Poultry Farm	Do.	132	434
Jas. Hitchcock	Do.	102	430
C. Doan	Do.	91	427
C. Rosenthal	Do.	103	388
W. C. Trapp	Do.	90	357
R. Burns	Silver-laced Wyandottes ...	116	335
*J. E. Smith	Plymouth Rocks ...	107	300
*Miss L. Hart	Rhode Island Reds ...	102	177
Total	...	8,659	35,102

* Indicates that the pen is being single tested.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
N. A. Singer	111	142	114	128	125	127	747
W. and G. W. Hindes	127	106	118	110	119	105	685
Bathurst Poultry Farm	86	86	110	115	125	101	623
T. Fanning	71	123	111	109	126	54	594
W. A. Wilson	95	89	79	112	100	110	585
Geo. Trapp	107	87	91	105	94	98	582
Mrs. L. Andersen	118	74	103	96	93	97	581
S. L. Grenier	94	65	104	102	105	107	577
R. Gill	106	103	112	90	75	88	574
J. M. Manson	97	83	105	81	108	98	572
W. Becker	92	64	106	93	99	110	564
H. P. Clarke	96	77	96	106	90	90	555
G. Williams	84	93	104	90	89	80	540
J. W. Newton	113	89	104	72	97	65	540
R. C. Cole	102	95	99	61	89	86	532
O. Goos	89	71	99	110	94	68	531
C. Goos	67	75	73	98	114	94	521
Oakleigh Poultry Farm	98	76	91	75	74	97	511
H. Fraser	88	98	87	76	71	90	510
Mrs. R. Hodge	110	57	83	83	102	74	509
J. W. Short	85	83	94	69	65	91	487

EGG-LAYING COMPETITION—*continued.* DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS— <i>continued</i>							
Mrs. E. White	99	23	95	60	107	98	482
Thos. Taylor	100	68	85	80	79	65	477
C. M. Pickering	100	95	59	75	84	60	473
M. F. Newberry	85	57	53	110	69	98	472
R. C. J. Turner	85	70	92	87	84	54	472
F. Birchall	80	86	52	41	99	90	448
E. A. Smith	90	64	91	83	55	62	445
HEAVY BREEDS.							
R. Burns	101	112	95	118	113	111	650
A. E. Walters	106	104	88	104	124	120	646
T. Hindley	82	103	66	138	137	78	604
H. M. Cnaille	113	95	111	100	105	72	596
R. Holmes	74	124	99	98	94	104	593
C. C. Dennis	90	103	94	79	97	82	545
E. F. Dennis	90	82	107	31	96	109	515
J. Potter	77	87	96	79	98	58	495
Rev. A. McAllister	87	101	104	54	25	99	470
Parisian Poultry Farm	53	73	85	54	83	86	434
J. E. Smith	34	62	48	40	53	63	300
Miss L. Hart	34	39	27	36	10	31	177

CUTHBERT POTTS, Principal.

WEIGHT OF EGGS, SINGLE HEN PENS.

	A.	B.	C.	D.	E.	F.	Average
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
LIGHT BREEDS.							
R. Gill	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
W. and G. W. Hindes	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
J. M. Manson	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
M. F. Newberry	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
F. Birchall	2	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
T. Fanning	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
Mrs. E. White	2	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
H. Fraser	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
Oakleigh Poultry Farm	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$
E. A. Smith	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$
W. Becker	2 $\frac{1}{8}$	2	2	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2
R. C. Cole	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2	2	2 $\frac{1}{8}$	2	2
Mrs. R. Hodge	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
R. C. J. Turner	2	2	2	2	2 $\frac{1}{8}$	2	2
C. Goos	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{1}{8}$	2	1 $\frac{1}{8}$	2	2
H. P. Clarke	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
T. Taylor	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2
C. M. Pickering	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
Mrs. L. Andersen	1 $\frac{1}{8}$	2	2	2 $\frac{1}{8}$	2	2	2
S. L. Grenier	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
N. A. Singer	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
J. W. Newton	1 $\frac{1}{8}$	2	2	2	2	2 $\frac{1}{8}$	2
Geo. Trapp	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2	2	2 $\frac{1}{8}$	2	2
G. Williams	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2	1 $\frac{7}{8}$	1 $\frac{1}{8}$	2
W. A. Wilson	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
O. Goos	1 $\frac{1}{8}$	2	1 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2
J. W. Short	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2	2	2 $\frac{1}{8}$
Bathurst Poultry Farm	2 $\frac{1}{8}$	2	2	2	1 $\frac{7}{8}$	1 $\frac{1}{8}$	2

WEIGHT OF EGGS, SINGLE HEN PENS—*continued.*

	A.	B.	C.	D.	E.	F.	Average.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
HEAVY BREEDS.							
H. M. Chaille	2	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2
J. Potter	2	2	2	2	2	2 $\frac{1}{8}$	2
Parisian Poultry Farm	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2
Rev. A. McAllister	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
J. E. Smith	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
R. Burns	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
E. F. Dennis	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$
T. Hindley	1 $\frac{7}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$
A. E. Walters	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2	2	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2
C. C. Dennis	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2	2	2	2
R. Holmes	1 $\frac{7}{8}$	2	2	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2
Miss L. Hart	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$

GROUP PENS.

	Average Weight.		Average Weight.

LIGHT BREEDS.

	Oz.		Oz.
T. H. Craig	2 $\frac{1}{8}$	A. Martin	2
H. Trappett	1 $\frac{7}{8}$	Parisian Poultry Farm	1 $\frac{7}{8}$
H. G. C. Wenck	2 $\frac{1}{8}$	C. H. Singer	2 $\frac{1}{8}$
B. Hawkins	2 $\frac{1}{8}$	R. C. Bartlem	2
J. Purnell	2	Brampton Poultry Farm	1 $\frac{7}{8}$
A. Anders	2 $\frac{1}{8}$	E. Symons	2 $\frac{1}{8}$
G. H. Richardson	2 $\frac{1}{8}$	J. H. Jones	2
N. J. Nairn	1 $\frac{7}{8}$	E. Stephenson	2 $\frac{1}{8}$

HEAVY BREEDS.

R. Burns	2	H. B. Stephens	2
W. C. Trapp	1 $\frac{7}{8}$	R. Innes	2
Mrs. L. Maund	2	Jas. Hitchcock	2
C. Rosenthal	2	Mrs. A. Kent	1 $\frac{7}{8}$
V. J. Rye	1 $\frac{7}{8}$	J. Hutton	2 $\frac{1}{8}$
W. Becker	2	Mrs. A. E. Gallagher	2 $\frac{1}{8}$
Wombo Poultry Farm	2	C. Doan	2

THE BIRTH OF ANOTHER CO-OPERATIVE ENTERPRISE.

Shipping Queensland Eggs to London.

Every person who is engaged in poultry-raising knows well that eggs at their present market value do not cover actual cost of production, and the lot of the poultry farmer would have been even worse had it not been for a new avenue of disposal of the surplus supply of eggs by export. Some millions of eggs have been sent South during the present "glut" season, but it is to the credit of the "Nupba" Co-operative Society Limited, that they arranged and carried out the first direct shipment of eggs from Brisbane to London.

The steamer "Leitrim" recently sailed for England with 400 odd cases, representing some 150,000 eggs, consigned from the society to the Overseas Farmers' Co-operative Federation. Although a very small quantity comparatively, this shipment is extremely important as it marks the commencement of a new era for the Queensland poultry farmer.

This useful society, which was founded by the Queensland Branch of the National Utility Poultry Breeders' Association, was primarily intended to supply the needs of the poultrymen with foodstuffs for their flocks at a low figure; but, in addition to doing this, the directorate, seeing the necessity of finding other markets for eggs during the season of heavy production, turned its attention to the handling of eggs. It is now prepared to accept consignments from all members; in fact, it is desired and hoped that ere long all persons engaged in the industry will recognise the need for organisation, and by sending their eggs through the society's pool ensure the fullest possible return for their product.

Latest reports from London as to the state of the market there seem to indicate that the financial results of the venture will be highly satisfactory.

The society has adopted the policy of paying a certain sum per dozen as an advance against the eggs, and when the proceeds come to hand from London, the expenses will be deducted and the balance distributed amongst all the suppliers on a *pro rata* basis.



PLATE 79.—PART OF A RECENT CONSIGNMENT OF EGGS SHIPPED BY THE "NUPBA" CO-OPERATIVE SOCIETY TO LONDON.

Every care has been taken in selection and packing so that the eggs should arrive safely and open up in an attractive manner. Particular attention has been paid to quality and size and no egg under 2 oz. in weight is being packed. The cases, which are made from specially selected timber, are divided into two compartments (each of which holds 15 dozen eggs), and white and brown eggs are packed in separate boxes. White patent fillers and wood wool are used for protection against breakage, and the general appearance of the eggs should satisfy the most exacting. On the outside of the cases "Eggs—Product of Queensland" is stamped in big lettering, and the State should have reason to be proud of this shipment.

The Agricultural Council has already recognised the need for fostering this industry, which already represents millions of pounds of wealth to Australia, and is capable of unlimited extension. When one considers that Great Britain consumes over 12,000,000 eggs daily, it will be seen what an opportunity there is for export to that country, particularly as our season of heavy production occurs just prior to the English winter.



PLATE 80.—EGGS FOR LONDON, A RIVERSIDE SCENE.



PLATE 81.—THE S.S. "LEITRIM" LOADING EGGS AT BRISBANE FOR LONDON.

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION.

Two thousand six hundred and eighty-nine eggs were laid during the month of October, or an average of 22.41 eggs per bird for the period. There have been one or two cases of broodiness, but the proportion has been very small indeed. The health of the birds generally still continues to be good, and in this respect, as well as the records of the birds, the competition compares very favourably with other similar contests.

Pen No.	Owner.	October.	Total.	Pen No.	Owner.	October	Total.
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WHITE LEGHORNS.

29	A. S. Walters ...	26	177	59	C. Pickering ...	21	131
2	A. Niel ...	31	176	16	T. Flood ...	8	130
33	J. Purnell ...	26	169	57	M. Newberry ...	21	129
43	J. J. Davies ...	29	168	36	Parisian Poultry	16	128
66	A. Cowley ...	29	166		Farm		
19	L. Andersen ...	26	164	82	E. C. Raymond ...	20	128
27	Oakleigh Poultry	27	161	54	A. W. Ward ...	25	128
	Farm			40	P. J. Fallon ...	27	128
77	Kelvin Poultry	23	160	26	P. F. Adams ...	23	127
	Farm			8	J. Harrington ...	18	125
62	H. Sturman ...	23	160	41	G. Williams ...	20	125
64	G. Trapp ...	28	159	73	A. F. Knowles ...	10	124
12	J. Potter ...	29	158	76	A. J. Bourne ...	26	124
7	J. Harrington ...	25	158	18	R. Shaw ...	26	123
72	Enroh Pens ...	25	157	74	A. F. Knowles ...	10	121
38	Carinya Poultry	21	155	22	K. Stephenson ...	20	121
	Farm			56	W. H. Lingard ...	22	121
25	P. F. Adams ...	24	155	51	F. R. Koch ...	23	121
34	J. Purnell ...	26	155	37	Carinya Poultry	25	119
61	H. Sturman ...	24	151		Farm		
70	A. Hodge ...	26	151	65	A. Cowley ...	22	115
68	R. D. Chapman ...	26	148	20	L. Anderson ...	25	115
47	M. J. Lyons ...	20	146	69	A. Hodge ...	9	113
55	W. H. Lingard ...	25	145	14	J. Hutton ...	23	109
63	G. Trapp ...	26	145	28	M. H. Campbell ...	30	109
53	A. W. Ward ...	28	143	28	Oakleigh Poultry	4	107
24	M. H. Campbell ...	20	142		Farm		
39	P. J. Fallon ...	26	142	5	Wambo Poultry	22	107
44	J. J. Davies ...	24	141		Farm		
13	J. Hutton ...	26	140	11	J. Potter ...	23	107
46	M. J. Lyons ...	23	138	81	E. C. Raymond ...	21	105
52	F. R. Koch ...	27	138	45	H. Needs ...	22	105
30	A. S. Walters ...	21	137	60	C. M. Pickering ...	23	104
79	W. Bliss ...	31	136	31	R. H. Woodcock	23	103
9	P. Ruddick ...	22	135	15	T. Flood ...	18	101
10	P. Ruddick ...	24	135	71	Enroh Pens ...	24	101
49	R. Turner ...	23	135	80	W. Bliss ...	25	101
35	Parisian Poultry	20	134	50	R. Turner ...	22	100
	Farm			78	Kelvin Poultry	26	96
6	Wambo Poultry	20	134		Farm		
	Farm			3	W. Becker ...	25	92
67	R. D. Chapman ..	27	134	4	W. Becker ...	19	81
17	R. Shaw ...	26	133	75	A. J. Bourne ...	26	74
46	H. Needs ...	25	133	32	R. H. Woodcock	21	72
58	M. Newberry ...	30	133	21	E. Stephenson ...	22	67
42	G. Williams ...	23	132	1	A. Niel ...	0	57

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION—continued.

Pen No.	Owner.	October	Total.	Pen No.	Owner.	October.	Total.
BLACK ORPINGTONS.							
96	R. A. Boulton ...	28	169	99	L. J. Prichard ...	18	126
107	E. Walters ...	22	162	102	Parisian Poultry	21	124
88	W. A. Blake ...	26	162		Farm		
92	C. C. Dennis ...	29	160	89	T. Brotherton ...	29	121
105	H. Pearce ...	23	152	111	A. Niel ...	26	119
93	E. F. Dennis ...	28	148	84	J. Hutton ...	23	119
95	R. A. Boulton ...	24	146	109	Wambo Poultry	23	118
101	Parisian Poultry	19	141		Farm		
	Farm			87	W. A. Blake ...	30	114
108	E. Walters ...	24	141	106	H. Pearce ...	21	112
91	C. C. Dennis ...	26	141	110	Wambo Poultry	18	100
100	L. J. Pritchard ...	22	138		Farm		
90	T. Brotherton ...	5	133	112	A. Niel ...	27	94
83	J. Hutton ...	22	133	98	Enroh Pens ...	17	93
103	J. Potter ...	18	132	94	E. F. Dennis ...	20	91
104	J. Potter ...	18	130	97	Enroh Pens ...	24	71
86	Kidd Bros. ...	12	128	85	Kidd Bros. ...	0	10
OTHER BREEDS.							
118	J. H. Jones ...	14	150	114	Parisian Poultry	17	106
120	T. J. Carr ...	26	143		Farm		
116	G. and W. Hindes ...	22	130	115	G. and W. Hindes	26	100
117	J. H. Jones ...	8	115	113	Parisian Poultry	23	91
119	T. J. Carr ...	26	112		Farm		

THE PRICE OF COTTON.

Conditions of the Government Advance.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has announced that, in accordance with the recent decision of the Government upon the question of ratoon cotton, the conditions under which advances will be made to growers of seed cotton, during the seasons 1922-1923 and 1923-1924, will be as follows:—

Season ending 31st July, 1923.

1. An advance of 5½d. per pound will be made on seed cotton of good quality (as defined in No. 2) and free from disease, delivered on rail or water.
2. Good quality cotton means seed cotton that is not ratoon cotton. It must be clean, properly packed, and not immature, stained, dirty, or otherwise damaged.
3. Seed cotton is cotton derived from seed planted annually. Ratoon cotton is applied to the second or any subsequent growth made by plants which have already been raised from seed, irrespective of whether such plants have borne a crop or not.
4. No advance will be made upon ratoon cotton, and such cotton will only be accepted at the grower's risk. It will not be passed through the gins until after the operations of the season for annual seed cotton have been completed, and it will not be exported to Great Britain. Full particulars of such ratoon cotton must be sent to the manager of the ginners to which it is consigned at the time of despatch, and any ratoon cotton found to be mixed with annual seed cotton in any consignment will entail the rejection of the whole consignment.
5. Seed cotton found to be not of good quality as defined in these conditions may be rejected, subjected to a lesser advance, or treated on growers' account as the Minister may decide.



Sitting—
 HAROLD PARKER, Manager,
 Messrs. William Calvert,
 and Sons, Preston.

HIS EXCELLENCY SIR
 MATTHEW NATHAN, P.C.,
 G.C.M.G.

CROMPTON WOOD, Managing
 Director, Messrs. Smith
 and Rathbone.

Standing—
 HON. CHAWFORD VAUGHAN,
 Managing Director, Aus-
 tralian Cotton-growing
 Association.

E. G. E. SCRIVEN, Under
 Secretary, Department of
 Agriculture and Stock.

L. ATKIN, Instructor in
 Cotton Culture.

Colonel HURLEY, C.M.G.,
 Commonwealth Immi-
 gration Department.

Hon. W. N. GILLES, Minis-
 ter for Agriculture and
 Stock.

W. P. ASCHOFF, Director
 Australian Cotton-grow-
 ing Association.

R. L. HARDING, Secretary
 to the Delegation.

E. F. CARTER, Consulting
 Engineer.

6. All grading and inspection of cotton at ginneries subject to an advance will be under the supervision and direction of officers of the Department of Agriculture and Stock, whose decision, subject to the right of appeal to the Minister, shall be final.

7. All cotton must be grown from seed obtained through the Department of Agriculture and Stock.

The advance mentioned in No. 1 is a minimum advance and any profit accruing after deducting the cost of ginning and marketing, will be divided *pro rata* amongst those who supplied the seed cotton.

Season ending 31st July, 1924.

1. Good quality cotton is defined as being seed cotton of good quality, free from disease and from the following defects:—That it is not ratoon cotton; is clean, properly packed, and not immature, stained, dirty, or otherwise damaged.

2. The term "ratoon cotton" is applied to the second or any subsequent growth made by plants which have already been raised from seed, irrespective of whether such plants have borne a crop or not.

3. Seed cotton is cotton in the seed from annual plantings.

4. An advance will be made for cotton of good quality, free from disease and defects:—

(a) To growers of seed cotton of 1½-inch staple—5½d. a lb.

(b) To growers of seed cotton of less than 1½-inch staple—4½d. a lb.

delivered at the nearest gin, or as may otherwise be arranged by the Department of Agriculture and Stock; but no advance will be paid to any grower for the product of more than 50 acres in any one season.

5. Any grower having a greater area of seed cotton than 50 acres can send his cotton from the area exceeding 50 acres for which advances are made, to the gin for ginning and marketing on owner's account and risk. Every grower of more than 50 acres of seed cotton must notify the manager of the gin and furnish him with full particulars of the excess quantity; failure to give information may jeopardise an advance on the first 50 acres.

6. The advances mentioned in No. 4 are minimum advances, and any profits occurring, after deducting the cost of ginning and marketing, will be divided *pro rata* amongst those who supplied seed cotton.

7. No ratoon cotton will be received at the gins.

8. Seed cotton delivered at the gin that is found to be of bad quality and not free from disease or defects as mentioned in condition No. 1, may be precluded from any advance, may be classed at a lesser value than the full advance, or treated on the owner's account as the Minister may decide.

9. All grading and inspection of cotton at ginneries, subject to an advance, will be under the supervision and direction of officers of the Department of Agriculture and Stock, whose decision, subject to the right of an appeal to the Minister, shall be final.

10. All cotton must be grown from seed obtained through the Department of Agriculture and Stock.

NOTE.—The rates and conditions of advances for the years 1925 and 1926 have yet to be determined.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

No. 15.

THE HAUER (*Dissilaria baloghoides*).

The Hauer is a very well-known tree in the "scrubs" (rain forests) of the North Coast line, where it is also known as Lancewood, Redheart, and Blackheart. The wood is very hard and somewhat flint-like, qualities which suggested the name Lancewood. It is much more durable than most of the scrub timbers and has been used for fencing posts. In general appearance, many of the trees somewhat resemble the Marara (*Weinmannia lachnocarpa*), but they are mostly smaller and the heartwood darker. The Hauer abounds in the Queensland coastal scrubs from Brisbane to Proserpine. There are a few trees of the species in Bancroft Park, Kelvin Grove. Most of the trees known to the authors are tall and slender, and rarely exceed 2 feet in barrel diameter. The bark is dark-brown, almost smooth, and often shed in thin flakes or strips; when cut it is seen to be red and measures ½ inch in thickness on a tree with a barrel diameter of 1 foot 9 inches.



Photo. by the Authors.]

PLATE 83.—THE HAUER (*Dissiliaria baloghioides*).
A specimen in the Kin Kin scrub.

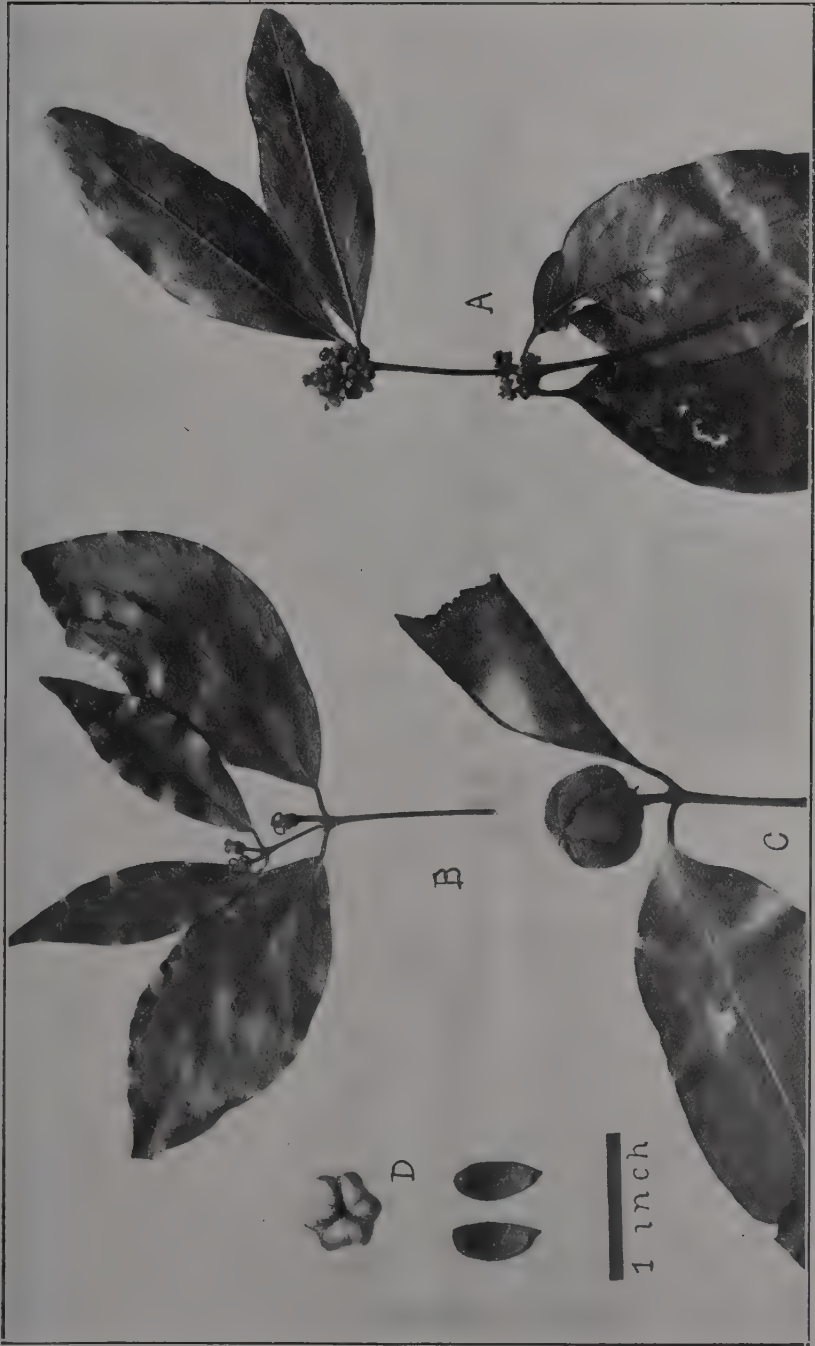


PLATE 84.—THE HAUER.

Showing, A male flowers, B female flowers, C capsule, D capsule with outer covering removed.

Photo : Dept. Agriculture and Stock.]

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS FOR SEPTEMBER, 1922.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			lb.	%	lb.	
Bellona	Ayrshire ...	30 Aug., 1922	1,020	4.0	57.70	
Confidence	" ...	13 Aug., "	780	4.0	36.30	
Thyra of Myrtleview	" ...	22 Aug., "	810	3.5	33.00	
Hedges Nattie	Friesian ...	20 May, "	690	3.8	30.90	
Songstress	Ayrshire ...	4 July, "	660	3.7	28.50	
Miss Fearless	" ...	30 May, "	600	4.0	27.90	
Dawn of Warragarra	Jersey ...	17 May, "	510	4.7	27.90	
Yarraview Slowdrop	Guernsey ...	1 Sep., "	540	4.4	27.90	
Pretty Maid of Haremar	Ayrshire ...	11 Sept., "	540	4.4	27.90	
Magnet's Leda	Jersey ...	8 Feb., "	510	4.5	27.00	
College Cold Iron	" ...	25 Jan., "	420	5.4	26.70	
Dear Lassie	Ayrshire ...	19 June, "	600	3.6	25.20	
Miss Betty	Jersey ...	17 May, "	450	4.6	24.30	
Prim	Friesian ...	6 Feb., "	630	3.3	24.30	
Snowflake	Shorthorn ...	20 Feb., "	540	3.8	24.00	
College Cobalt	Jersey ...	3 April, "	420	4.6	22.50	
College Ma Petite	" ...	5 Feb., "	420	4.5	22.20	
Netherton Belle	Ayrshire ...	19 July, "	480	3.9	21.90	
Fair Lassie	" ...	1 Sept., "	600	3.0	20.70	
La Hurette Hope	Jersey ...	30 June, "	420	4.2	20.70	
College La Cigale	" ...	10 July, "	420	4.1	20.10	

Rainfall for the Month, 96 points.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 27.

TUMBLING MUSTARD OR ORIENTAL ROCKET (*Sisymbrium orientale*).

Description.—An erect branching annual or biennial herb about 1 to 3 feet high. Stems smooth or clothed with a few hairs. Leaves glabrous or more commonly thinly clothed with longish hairs tapering at the base into long slender stalks; lower leaves deeply lobed, the terminal lobe the largest; uppermost leaves narrow-lanceolate, entire (not lobed or toothed). Flowers small, yellow; seed pods very slender, straight or more or less curved, 3 to 4 inches long, slightly hairy; seeds very numerous, small (about $\frac{1}{2}$ line long), oval with a U-shaped furrow on one side, light brown in colour.

Distribution.—A native of Southern and Central Europe; now a naturalised weed in many countries.

Botanical Name.—*Sisymbrium*, from the Greek word *sisymbron*, the name of some sweet-smelling plant, probably mint or thyme; *orientale* (Latin) meaning eastern, no doubt, from the plant extending to Eastern Europe and Western Asia.

Properties.—Not known to possess any economic properties. It is not harmful in any way, but, like other plants of the family Cruciferae, would, no doubt, give a turnip-like taint to the milk of cows feeding on it to any extent.

Eradication.—So far as observed in Queensland, the "Tumbling Mustard," though fairly common, is not very aggressive; and beyond hand pulling or hoeing, calls for no special methods of eradication. Its smooth leaves and stems militate against the use of sprays. Though occasionally found in northern parts, it is more abundant in the cooler parts of the State.

Botanical References.—*Sisymbrium orientale*, Linn. Cent. Plant. 11, 24; Jacq. Fl. Austr. IV. 12.

This weed was referred by the late F. M. Bailey ("Queensland Agricultural Journal," Vol. XXI., 1908, p. 292) to *S. Irio*, but seems to agree better with the plant described above. It is also very similar to *S. altissimum*, a common weed in Canada and the United States, only differing in one or two minor characters.



Photo : Dept. Agriculture and Stock.]

PLATE 85.—TUMBLING MUSTARD, OR ORIENTAL ROCKET (*Sisymbrium orientale*).



PLATE 86.—BELL DE KOL ONGARRIE (IMP., N.Z.)

A direct descendant of the World's Champion Friesian Cow, Westmere Princess Pietertge, the gainer of an official record of 939.78 lb. butter in one year. The property of Mr. P. P. Falt, Ryfield Friesian Stud, Tingoorra.



PLATE 87.—OAKLEA NOREEN (IMP., NO. 251).

A cow with an official record of 62 lb. milk, 3.80 lb. butter in 24 hours. Winner of nine Home Milking Competitions against all breeds, also winner of Royal National Home Milking Competition, 1921. She holds the production record for Queensland over all cows of all breeds at her age, 4 years 2 months old. The property of Mr. P. P. Falt.

THE SOLAR ECLIPSE.

GEOLOGICAL SIGNIFICANCE OF SOLAR PHENOMENA—IS A DROUGHT LOOMING?—THE JENSEN THEORY OF INTER-RELATIONSHIP.

The recent total eclipse of the sun clearly demonstrated that we are approaching a sunspot minimum, which, in its turn, raises the question whether the earth's climate and such phenomena as earthquakes, volcanic eruptions, and droughts are influenced or not by sunspot conditions. It will be interesting, in the circumstances, to see if the coming year—1923—which will be a year of sunspot minimum, will be accompanied, so far as Australia is concerned, with drought conditions and by volcanic eruptions and earthquakes in other parts of the world.

SUNSPOTS AND TERRESTRIAL DISTURBANCES.

Dr. H. I. Jensen (Queensland Geological Survey) has advanced the theory of the inter-relation between sunspots and terrestrial disturbances. Sir Edgeworth David, commenting on this theory in the Sydney "Daily Telegraph" of 16th January, 1907, expressed the opinion that it was "one of the most reasonable yet put forward, as Jensen had quoted an immense amount of evidence to show that there was a distinct inter-relation between sunspots on the one hand and volcanic and seismic phenomena on the other."

According to the Jensen theory, during the sunspot minimum, earth temperature is probably also at a minimum, and consequently heat is then being radiated outwards into space more rapidly than at other times, thereby intensifying the contraction and fracturing of the earth's crust, both of which processes are, no doubt, very important factors in producing earthquakes and volcanic eruptions. At the same time, as there is a close relation between earth magnetism and sunspots, it is possible that variations in earth magnetism depending for their periodicity on the sunspot period, or half period, may also be a determining factor.

SUNSPOT MINIMUM AND DROUGHTS.

It has been proved that in years of minimum sunspot intensity Queensland experiences scorchingly hot summers, and every part has cold winters for its latitude. In New South Wales the summers are hot, with frequent north-west winds, relieved at times by "southerly busters"; the winters are cold and rather protracted, but as the atmosphere is dry, the cold is not felt as much as in the wet winters accompanying a sunspot maximum, and the nights are not rendered unpleasant by rain, fog, or snow. In years of minimum sunspot intensity, the Central Australian cyclonic area in summer is of comparatively small dimensions, and consequently the outward-blowing hot winds reach the surface of the earth in the coastal districts, giving (for instance, Sydney) frequent north-west winds. In winter this area is covered by a vast permanent anti-cyclone, from which the cold, dry westerly winds originate. The anti-cyclone belt is greatly widened, and the rain-bringing monsoonal and antarctic V disturbances are consequently not frequent.

It is no mere coincidence that the years 1811-12, 1844-46, 1864-69, and 1896-1902 were years of drought in the greater part of the world, and at the same time periods of sunspot minimum. Nor does it seem a coincidence that 1864, 1870-72, 1893-4—periods of sunspot maximum—were wet years over the greater part of the earth's surface.—"Queensland Government Mining Journal."

KUDZU.

A REMARKABLE FODDER PLANT—A QUEENSLAND FARMER'S OBSERVATIONS.

Impressed by glowing accounts of Kudzu as a fodder plant, Mr. Hugh McMartin, of Pullen Vale, Indooroopilly, obtained some roots for local experiment. Of the results of this experiment Mr. McMartin writes:—

It is now a little over a year since the Kudzu Fodder Vine was introduced to Queensland and the first roots set on my farm at Pullen Vale, but such has been the headway made by the plant that even in this short period sufficient has been learnt of its characteristics and habits to give one a fair idea of its possibilities under local conditions. The reputation earned by Kudzu in Florida, U.S.A., is so remarkable that one may be pardoned for being at least a little sceptical as to the truth of the claims made for it by enthusiastic growers in the United States, but the writer has had ample evidence to prove that Kudzu will show results here almost, if not quite equal, to those obtained overseas.

In the first place Kudzu is an exceptionally rapid grower, and I have observed the main runners to advance at the rate of eight to nine inches during twenty-four hours in damp, warm weather. It will resist dry weather effects splendidly, as evidenced by the fact that although we have had little beneficial rain for over seven months my Kudzu vines are a mass of succulent, dark green leaves and the runners are growing several inches a day.

Kudzu, being a deep-rooter, can obtain a plentiful supply of moisture from the soil and subsoil while the average of our grasses and shrubs are perishing.

I have tested the plant under the most severe conditions of heat, drought, and frost, and it has come through them all remarkably well.

Such great growth progress has Kudzu made here that I have even been able to carry out a few small experiments in stock feeding with it, and once more the result has been most gratifying. During the very dry winter the Kudzu patch was fed down several times with sheep, and on each occasion, despite the absence of rain, no sooner were the animals removed than the plant began to send out fresh shoots. I was also agreeably surprised to observe that sheep which had become anaemic recovered remarkably when fed on Kudzu.

My Kudzu vines have given no evidence of a desire to seed, propagation being from the roots that strike into the ground from the nodes on the main runners.

An American claim for Kudzu is that it will carry six milking cows to the acre when grown on trellises about 12 feet apart; also that as much as 10 tons of fodder per acre may be obtained from it. Judging by its performances here to date, I see no reason to discredit these claims. Once stock begin eating Kudzu they soon become exceedingly fond of it, and the grower will be well advised to keep the fences surrounding his Kudzu patch quite stock proof. Wild creatures such as hares, wallabies, and bandicoots also evince a keen desire to investigate the Kudzu vines, and will take most unusual risks to feed upon it.

In order to obtain a satisfactory "strike" Kudzu roots should be planted in damp soil and watered every few days for about a fortnight. Once started the plant looks after itself.

It seems highly unlikely that Kudzu can ever become a pest in any way. Its leaves are soft and juicy, like other legumes, and, of course, it is quite unprotected by thorns.



PLATE 88.—IN A DAWSON VALLEY GARDEN. A MINISTERIAL VISIT TO CRACOW STATION.

From the Right: THE PREMIER HON. E. G. THEODORE, MR. F. M. FORDE, M.L.A., HON. JAMES STOPPORD, —, HON. J. LARCOMBE.

Event and Comment.

Saving an Industry—Proposed Arrowroot Pool.

The arrowroot industry is threatened with extinction. With stocks on hand equalling about two years' normal consumption, and lacking selling organisation, the growers are helpless. The price they are receiving for their labour is below the cost of production and bears no relation to the price paid for arrowroot by the consumer. Adversity has brought growers and manufacturers together, and on 20th September last, a deputation comprising arrowroot growers waited upon the Wheat and General Agriculture Committee of the Council of Agriculture with the object of explaining the present position of the industry in Queensland, and urging upon members the need for an arrowroot pool. The Committee sympathised with the request, and deputed the Director (Mr. L. R. Macgregor) to visit localities where the crop is grown and obtain first-hand information respecting the condition of the industry. Subsequently, at Beenleigh, he addressed what is said to have been one of the largest meetings of primary producers ever held at that centre. The growers were shown how the principle of co-operation applied to their industry would tend to eliminate speculators and operate in the direction of a more stabilised market. He stressed the fact that co-operation rests upon the common economic interests of men engaged in the same pursuit, and unfolded a marketing plan which promised to save the arrowroot industry.

At the last meeting of the Council of Agriculture, a deputation of those engaged in the industry attended and presented a petition signed by growers present at the Beenleigh meeting, asking the Council to recommend to the Government the constitution of a pool. The deputation urged that immediate action be taken to institute the pool, as the planting season is now almost completed and it is urgently necessary to reassure the planters.

The matter was considered by the Council, and it was decided to recommend the immediate establishment of a pool in accordance with the provisions of the Primary Products Pools Act of 1922. The Premier (Hon. E. G. Theodore), to whom the circumstances of the industry were explained by Mr. Macgregor, has taken prompt action, and it is understood that an Order in Council has been approved notifying the intention of the Governor in Council to declare arrowroot a commodity under the Primary Products Pools Act.

The Director pointed out that the institution of a pool will not involve Government control of the product. The Pools Act was not designed for that purpose. In fact, the Act specifically lays down that boards administering pools will not represent the Crown for any purpose whatsoever. It is provided that, when a pool is constituted under the Act, representatives of growers shall be appointed to administer and control the affairs of the pool.

The marketing plan drawn up by Mr. Macgregor is not a hard and fast set of rules, but merely sets out certain suggestions for the guidance of the representatives of growers. Provision is made for creating a local demand for the product, the qualities of which are little known to the public. Judicious publicity to stimulate this demand is recommended, and if this policy be given effect to, the existing stocks can most readily be cleared before next season.

Growers of arrowroot and those millers who have invested capital in plant and machinery will now be considerably relieved. They will view the future with more confidence, and before the planting season closes will, no doubt, plant the full area of land they have available with excellent prospects of a reasonable return.

An Experiment in Lamb-raising—Kudzu Leaves and Sweet Potatoes.

An experiment in lamb-raising which should be of much interest to Queensland coastal stockowners is being carried out by Mrs. Hugh McMartin, of Pullen Vale, Inndooroopilly. Taking three Dorset Horn ewes with young lambs at foot, about two months ago, Mrs. McMartin began feeding the mothers with a diet of which the principal items were leaves of the Kudzu fodder vine and sweet potatoes. Almost at once a remarkable change for the better was shown in the condition of both ewes and lambs, giving the observer the impression that the mothers' milk flow had improved both in quantity and quality. When the youngest lamb was

fifty days old they were weighed. One ram lamb, fifty days old, scaled 53 lb.; another ram lamb, fifty-five days old, weighed 54 lb.; and a ewe lamb, fifty-nine days old, 54 lb.

Both ewes and lambs appeared to relish the unusual diet exceedingly, and every particle of their Kudzu-potato meals is greedily devoured. The lambs are to be weighed again when the youngest is seventy-five days old.

Profitable Lambs—An Interesting Test.

For the purpose of comparing the relative advantages of using Dorset Horn and Corriedale rams on first cross ewes to raise lambs for sale in the sucker stage, a test is being conducted at the Wagga Experiment Farm, where 400 Border Leicester Merino cross ewes were mated with Dorset Horn rams and a similar number with Corriedales. The first sucker lambs of the two series to be ready for market—being about four and a-half months old—were sold recently at public auction with the result that the Dorset Horn cross lambs averaged 21s. 7½d. per head and the Corriedale cross averaged 19s. 8½d. The New South Wales departmental Sheep and Wool Expert (Mr. F. B. Hinton), in reporting the result of the sale, mentioned that the Dorset Horn suckers were much admired and were more fancied by the export buyers than the others.

"Bunchy Top" in Bananas.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) is closely interested in the developments relating to a reported discovery of a means of defeating the "bunchy top" disease on border plantations and the department is well informed as to the progress of experiments and tests being carried out by the trans-border authorities and others interested, including Mr. Marks, of Terranora, Tweed River. So far, only a small measure of success has attended official tests and experiments and this fits in with the experience of the Fijian authorities. In Fiji, where it is known as "strangles," "bunchy top" is said to have existed there for forty years.

To check the spread of the disease, the New South Wales agricultural and fruit authorities, in addition to experiments and tests and dipping and manurial investigations, have prohibited the removal of banana suckers from certain of the Northern Rivers areas.

The affected region reaches down towards Byron Bay, and the Brunswick River is now affected. The Richmond River area is clean. Plants may not be taken south of a line drawn from east to west south of the Brunswick. Great care is also being taken in respect of the introduction of plants from Queensland. No plants may be taken there from Queensland unless the Government banana expert, inspector, and instructor (Mr. Reg. G. Bartlett), of the New South Wales Department, has first inspected the Queensland plantations from which it is proposed to purchase the suckers, and also unless they have been inspected by him when they reach the border at the Tweed.

"Bunchy Top" or "Choke Throat."

In the course of a recent Press interview, Mr. Bartlett said that, despite reports to the contrary, he believed that there was no "bunchy top" in Queensland north of Nerang. Many growers confused "bunchy top" with what was known as "choke throat"—a form of growth which had been very prevalent in both New South Wales and Queensland. It was simply due to the adverse seasonal conditions—the dry weather—ruling about six months ago, which caused the throat of the banana to contract at the top, and the bunch was thus unable to emerge. However, growth took place from the bottom, and the stem was pushed round, sometimes in a circle and sometimes into an "N" shape. Thus it was sometimes referred to as "goose neck."

Mr. Bartlett pointed out that a similar trouble was experienced in Queensland seven or eight years ago in one of the best of spring seasons so far as rainfall went, but it followed an extremely dry autumn and hard winter.

Notwithstanding the inroads of "bunchy top," the production of bananas in New South Wales had materially increased. This was due to the fact that new areas had been, and were being, brought under bearing. Nevertheless, many growers were being forced out of the industry. So far the only remedy seemed to be to cut out the plants.

Mr. Marks, of Terranora, who was carrying out further tests with his remedy for "bunchy top," was very optimistic of the result. So optimistic was he that in an arrangement with a growers' organisation for tests over a stated period, and for which, if successful, he was to receive a substantial reward, he refused an offer that he should be required to demonstrate only 95 per cent. free over a period of two years, and claimed that he could demonstrate 100 per cent. free. The results of the test were being awaited with the utmost interest. The Government intended to run parallel experiments to test Mr. Marks' theory and treatment.

Co-operative Marketing.

The benefits of co-operative marketing are now being recognised by primary producers all over the world, and Queensland farmers have already experienced something of the advantages accruing from practical applications of this principle. Much good, solid spade work has already been done on the commercial side by existing co-operative companies, and to them is due the credit that should be accorded the pioneers in any forward movement. In some directions, however, particularly in the matter of marketing, it has been found that separate co-operative units operating independently cannot protect fully the interests of primary producers. Modern marketing economy, therefore, demands unity of effort by instituting methods of compulsory co-operative marketing, which have become to be known as "pools." War-time experience demonstrated the advantages of this form of co-operation by—(1) eliminating unnecessary cost as between grower and consumer; (2) blocking unnecessary competition between growers to the benefit of unnecessary middlemen; (3) stabilising prices; and (4) facilitating the financing of marketing and other operations. So manifest were the advantages through war-time pools that a large volume of opinion among the producers of the Commonwealth is now definitely and strongly in favour of the perpetuation of the pooling principle.

Procedure in Instituting a Pool.

On the recommendation of the Council of Agriculture, the Minister may, by notice in the "Gazette," notify the intention to make an order instituting a pool in thirty days from the date of "Gazette" notice. The board of representatives of growers, when appointed by Order in Council, would then proceed to make arrangements for the receiving, financing, and marketing of the commodity, and would be responsible to account to the growers for the proceeds. All of the particular commodity being pooled, grown in the State, unless by specific exemption, would, upon the constitution of a pool, be marketed by compulsory co-operation for the benefit of the growers by the board of growers' representatives.

Within thirty days after the publication of the first notice of the proposal to make an order to constitute a pool, if fifty or more growers in the district concerned petition the Minister to take a poll before the order is made, the Minister shall take a vote of the growers of the product on the question, and if less than three-fourths of the votes are polled in favour of the pool, the order to constitute a pool shall not be made. "*The Primary Products Pools Act of 1922*" was designed for the benefit of the producers of our main primary products. It is a measure planned in the interests of producers, and providing for control by producers of the products of their own industry.

The Need for Pooling Legislation.

Pools constituted during war time had the protection of the War Precautions Acts and kindred legislation, whereby the boards charged with the administration of these pools were clothed with adequate powers to complete financial and all other arrangements, to enter into legal contracts, to sue and to be sued, and generally to carry out the work entrusted to them on behalf of the producers. Voluntary pools not protected by legislation have experienced difficulties in all of these respects. By legal decisions in Commonwealth Courts of Law, notably in the instance of the Port Huon (Tasmania) fruitgrowers' action, and in the Victorian oniongrowers' case, contracts made by voluntary pools have been judicially set aside, and the objects for which such pools were constituted have been nullified. Moreover, voluntary pools have found it difficult to afford their pool growers sufficient protection against produce, not in the pool, being used in prejudicing and undermining the arrangements made for the marketing of the pooled product, to the detriment of growers as a whole.

Primary Produce Pools Act.

In order to meet these difficulties and to afford growers a means whereby pools may be given legal status, and to permit of growers' representatives exercising the necessary measure of control for the protection of the producer, the Minister for Agriculture (Hon. W. N. Gillies) introduced a Bill, which subsequently became law, last session, and which is now known as "*The Primary Products Pools Act of 1922.*" The provisions of the Act may be applied to any product of the soil in Queensland, and any dairy produce and any article of commerce prepared other than by process of manufacture from the produce of agriculture, or other rural occupations in the State.

Provision for Genuine Control by Growers' Representatives.

The Act in question is not designed to institute Government control of any commodity. In fact, the Act specifically lays down that boards administering pools will not represent the Crown for any purpose whatsoever. It is provided that when a pool is constituted under the Act, representatives of growers shall be appointed to administer and control the affairs of the pool. The Act provides for no Government representation whatever, but the Legislature, with a view to protecting the rights of every producer interested in a pool, has stipulated that the Auditor-General shall exercise an oversight over the financial transactions of every pool and audit its accounts, and that in this connection also the Act provides that a statement of accounts shall be exhibited as may be prescribed by the Governor in Council. This is a precaution which every producer will readily endorse.

How Pools may be Formed.

The Act provides that a pool may be declared by Order in Council upon the recommendation to the Government by the Council of Agriculture. The case for the institution of the pool should be clearly set out. An estimate of the quantity produced, with information respecting localities of production, and, if possible, the cost of production, should be supplied, as well as an outline of the difficulties hitherto met with by growers in marketing the commodity in question. Finance is an important question confronting any proposed pool. The policy of the Federal Government in regard to a Commonwealth Fruit Pool, as enunciated recently, should serve as a guide to any pool in making their financial arrangements. The Commonwealth clearly laid it down that the credit of Australia (through the Commonwealth Bank) would be granted to a Fruit Pool provided that the Government was satisfied that the administration of the pool was in the hands of an efficient organisation which would protect the industry and the producers engaged in it, handle marketing problems, open up new markets, and generally advance Australia's interests by increasing production and export trade. As any Queensland Pool Board will necessarily have to arrange for finance (as provided in the Act) no doubt any financial institution if approached will also require to be similarly satisfied in this regard, and in any representations to the Council for the formation of a pool, full particulars of the proposed arrangements in regard to finance should also be submitted for the Council's guidance. The information required is somewhat analogous to that contained in the clause usually found in a prospectus outlining the satisfactory financial arrangements made with the vendors in regard to assets vital to the formation and carrying on of the business of a proposed company. Complete information must be prepared to enable the Council of Agriculture to arrive at a decision and to justify it in making the necessary recommendation to the Government.

Crossbred Wheat on Cecil Plains.

When the Cotton Delegation visited the Cecil Plains Soldiers' Settlement on the Darling Downs, its members were shown a splendid crop of wheat of the crossbred type. Captain Binnie, the supervisor of the settlement, had been inclined to plant a fairly large area with the Florence variety, but the State Director of Agriculture (Mr. H. C. Quodling) pressed him to sow crossbred wheat. He did so, and the good results obtained were readily apparent. While the Florence had failed in this particular instance, the crossbred type had thrived well, and at the time of inspection presented a very healthy appearance. Captain Binnie estimated that a four to five bag crop would be the result from the crossbred wheat—and nothing from the Florence variety. Usually Florence wheat is among the most prolific on the Downs, but it had failed under the conditions prevailing at Cecil Plains.

Don'ts for Cotton Planters.

Among recent callers to this Office was Mr. J. G. Powell, a cotton planter from the State of Georgia, U.S.A., who has been engaged by the Australian Cotton Growers' Association as an instructor in cotton culture. Mr. Powell has already seen something of Queensland cotton fields and noted the methods adopted by new growers. This has caused him to stress the following don'ts which are based on his own experience:—

1. Don't plant your cotton until the land is thoroughly prepared.
2. Don't try to plant cotton seed to proper stand, that is, correct spacing between stalks. Cotton growers have been experimenting on this for hundreds of years, and have not solved it yet. You are wasting time and labour instead of saving it. Plant thickly and cut down to proper stand with hoe when plants are 4 inches to 6 inches high.
3. Don't let weeds and grass get started; cultivate often, when shallow cultivating will suffice.
4. Don't plough or harrow deeply close to the drill, especially when the plants are in the more advanced stage.
5. Don't forget to replant by hand all missing spaces along the row as soon as possible.
6. Don't forget that the more fertile your land the thicker to leave the plants, but in no case less than 12 inches apart.
7. Don't have rows more than 4 feet apart. In most fertile land plant closer than in poorer soil.
8. Don't fail to keep your rows as near as possible a uniform width, this will aid you materially in cultivation.
9. Don't let soil form a hard crust after planting; break it as light as possible, preferably with spring tooth harrow.
10. Don't forget that proper planting and afterwards chipping down to proper stand, will produce a stalk of proper size, both for producing cotton and to assist materially in picking.

Revelation and Education.

In the course of a letter to the Premier (Hon. E. G. Theodore) Mr. R. Harding, Secretary to the Cotton Delegation, commented very interestingly on Queensland and her cotton future. He writes:—"May I offer you my sincerest thanks for the most interesting case of cotton samples which you have so very kindly sent me. Our tour through your State has been a revelation and a great education to me. I could not have believed the unbounded possibilities of Queensland unless I had been permitted to see them as we have. As the years go by and the cotton industry here expands until it rivals and surpasses the wool industry of Australia, an added interest and value will attach themselves to your gift and serve to remind me of the whole-hearted support and enthusiasm which you gave to that industry when it was in its birth."

The Dairy Industry—Reported Neglect of Cheese.

Speaking recently on a report furnished to the Agent-General by a London butter expert containing an allegation that Queensland was devoting undue attention to butter to the neglect of cheese, the Minister for Agriculture (Hon. W. N. Gillies) said that he would like to emphasise that Queensland, rather than neglecting cheese production as alleged, was the principal producer of cheese in the Commonwealth, and under normal conditions the cheese factories here manufactured more cheese than did any of the other States, while as far as the export trade was concerned 75 per cent. or more of the total complement of cheese exported each year from Australia had been of Queensland origin. Consequently it could not be rightly said that this State was responsible for neglect of the cheese branch of the dairying industry.

Mr. Gillies pointed out that the respective market quotations for butter and cheese fluctuated considerably, and on occasion it happened that the preference in the market value was in favour of butter, and in such instances the dairymen were inclined to supply cream to a butter factory rather than to supply milk to a cheese factory, and in this way the output of cheese was affected from time to time. To a limited extent this influence had been operative recently, but the chief factor causing a temporary reduction in the volume of the cheese output was the absence of rain in the dairy districts, causing an appreciable reduction in the quantity of milk supplied to the cheese factories. Immediately the weather broke the production of cheese would increase, provided that the price offering was considered satisfactory to producers.

Production, Prospects, and Prices.

The information set out hereunder has been abstracted from departmental summaries of market movements and weather conditions for the month of October.

Agriculture.

The first week of the term was rainless and the wheat outlook was growing more dismal. In localities where somewhat heavier rain had fallen in the early growing period wheat crops, though short and poorly developed, were just about holding their own. On the early planted and well-prepared lands the best crops were seen. Much of the growth was being fed off by dairy stock. Cotton was maintaining popular interest, and many plots were being prepared. The market was affected by the dry spell and prices firmed.

The second week saw a prospect of total grain failure in many wheat areas. Not an acre was freshened by a splash of the needful. There was still a prospect of a light crop where the most careful cultural operations had been carried out if rain followed soon. In the Inglewood district stock losses were reported. Early sown maize and potatoes, although looking well, were badly in need of a shower. Large areas of land were waiting for weather improvement to receive sowings of maize and cotton. All lines were in strong market demand.

Very useful and widespread rains were the most encouraging feature of the week ended 21st October, the third period of the month under review. Up to nearly 4 inches were registered in the agricultural areas. In localities on the wheat belt where crops were not beyond recovery, prospects brightened. Maize and other crops revived to a large extent. On the coast the rainfall was scattered and generally light, but pastures were refreshed to the extent of appreciably improving the cream yield.

Further beneficial rain fell in the course of the last week of the period under review throughout practically the whole of Southern Queensland. On the Darling Downs were registered the heaviest falls. Maize and cotton were being sown in large areas and generally the immediate outlook had improved vastly.

The Markets.

Product.	Week ended 7th October.	Week ended 14th October.	Week ended 21st October.	Week ended 28th October.
Lucerne chaff	Prime to 13s. 6d.; Inferior to 4s. 1d.	5s. to 12s.; Other lines held at 4s. 3d. to 11s. 3d.	5s. 3d. to 10s. ..	5s. to 9s. 3d.
Oaten ..	Border, prime to 10s.; Local, 4s. 3d. to 5s. 6d.	7s. 6d. to 10s. 3d.; Local to 6s. 10d.	7s. to 9s. 9d. ..	9s. 6d.; Local 6s. to 8s. 2d.
Mixed ..	6s. 7d. to 8s. 6d.	5s. 9d. to 8s. ..	5s. to 9s. ..	5s. 9d. to 8s. 10d.
Maize	Prime to 5s. 2½d.; Other to 4s. 11d.	5s. 2d. to 5s. 4d.	Unchanged ..	5s. 1½d. to 5s. 4d.
Potatoes ..	Prime to 17s. 9d.	To 19s. 2d. ..	Prime to 19s. 8d.; Other to 6s. 3d.	9s. 7d. to 16s. 10d.
Sweet potatoes	4s. to 8s. 6d. ..	4s. to 7s. 3d. ..	5s. to 6s. 6d. ..	5s. 6d. to 8s.
Pumpkins ..	4s. to 6s. 2d. ..	3s. 6d. to 6s. 3d.	2s. to 6s. 1d. ..	4s. to 7s. 9d.
Wheat (feed) ..	5s. 8d., passed	6s. 6d. to 6s. 3d.	5s. 6d. to 6s. 6d.	5s. 10d. to 6s. 5d.
Broom millet ..	Prime hurl, £50	£40 to £50 ..	Unchanged ..	Unchanged
Barley	Market bare ..	Unchanged ..	4s. 7d.	..

Live Stock.

ENOGGERA MARKETS (1st November).—At the Enoggera live stock markets on Wednesday, 1st November, 7,670 sheep were penned. With the exception of about 2,000 sheep from the Central district, which were in only store condition, the quality of the yarding was satisfactory, there being a large number of small drafts of good to prime sheep from the Darling Downs. There was a large attendance of butchers, including many from the country, and competition for good to prime sheep was brisk and well sustained. The market opened to a very strong demand, with prime wether mutton realising 5½d. to 6d. per lb. and continued at about this level throughout, closing sales being equal to the best of the day. A small draft of very prime shorn Merino wethers from the Darling Downs sold to 35s. and averaged 29s. 7d., and other drafts averaged 25s. to 27s. Quotations:—Three-quarter to full-woolled and half-woolled Merino wethers, none offering; short-woolled, 18s. to 35s.; half-woolled Merino ewes, 17s. to 23s. 3d.; short-woolled, 11s. to 23s. 3d.; three-quarter to full-woolled crossbred wethers, 33s. 6d. to 37s. 6d.; short-woolled, 19s. to 29s.; full-woolled crossbred ewes, 23s. to 28s.; short-woolled, 15s. to 27s. 6d. Prime heavy lambs, 16s. to 30s. 3d.; good, 11s. to 15s.; light, 7s. 3d. to 10s. 6d.

Of fat cattle about 1,900 head were yarded. The cattle generally were of very good quality, there being a high percentage of good to prime bullocks and a number of drafts of prime cows. There was a very large attendance of buyers, including many from the country. One large buyer operated with freedom and secured about 600 head. The sales opened to a good general demand, with prices on a par with the previous week's rates, but the market became irregular as sales progressed, and prices showed a weakening tendency, closing rates showing a distinct decline on those at the opening sales. Prime bullock beef realised 20s., with occasional pens at 22s. per 100 lb., at the opening sales, but closing rates were 18s. to 19s. Cow beef was worth 17s. to 19s., with odd pens to 20s. A small draft of prime bullocks and cows from Cheepie were sold, the bullocks averaging £9 3s., and the cows £6 a head. Quotations:—Prime heavy bullocks to £11 2s. 6d.; prime, £7 to £8; good, £6 to £7; light, £4 10s. to £5 15s.; prime heavy cows to £8 10s.; prime, £4 5s. to £5 5s.; good, £3 to £4; light, £2 to £3; vealers and weaners, 6s. to £2 14s.

Fruit and Vegetables.

ROMA STREET (31st October).—Beans, 3s. to 7s. 6d.; peas, 4s. to 10s. per sugar bag; cabbage, 3s. 6d. to 10s.; pumpkin, 4s. to 8s.; marrows, 2s. to 3s. 6d.; cucumbers, 9d. to 2s. per dozen; smallgoods, 1s. to 2s. a dozen bunches; tomatoes, 3s. 6d. to 8s. per quarter-case; apples, eating 14s. to 16s., cooking 10s. to 15s.; oranges, 10s. to 15s.; mandarins, 5s. to 16s. a case; lemons, 3s. to 4s.; passion fruit, 8s. to 11s. 6d.; papaws, 2s. to 3s. 6d. per quarter-case; bananas, 2d. to 9d. a dozen; pineapples, 2s. 6d. to 8s. a dozen, odd choice lots to 10s.; eggs, guaranteed special, 11d. to 1s. a dozen.

CERTIFICATE OF SOUNDNESS.

A Certificate of Soundness was issued for the underlisted stallion in the courset of the month of October, 1922.

Name of Stallion.	Breed.	Period for which Certificate issued.	Owner's Name.	Owner's Address.
Baron Kilvie	Clydesdale	12 months	J. H. Kilvington	Glenore Grove, Forest Hill

General Notes.

The Pig that Pays.

There is great temptation when times are bad in the special line of farming or stock-raising you have taken up to change over to another line, provided climate and other conditions are suitable; but experience teaches that by far the safest method is to go in for one definite branch as a foundation and to stick to it consistently, however you may vary your side lines. That is the advice of one of the biggest pig-breeders in Illinois, who has seen many ups and downs in the industry, but has always found that, provided the foundation stock are good, the swing back of the pendulum from bad to good seasons will always bring sufficient profit with it and more than counterbalance the lean times. He believes in Poland-Chinas, which also do very well in this country. As he credits his system of feeding with much of his success it may be worth while to briefly summarise it here.

The sows are bred for early spring farrow. As farrowing time approaches they are housed to accustom them to their surroundings, so that they will be quiet and contented when the pigs come. Their ration consists of ground lucerne or soybean hay, with a slop made of boiling water and ground corn. After farrowing, the same ration is continued, with an extra portion of ground lucerne to keep the bowels free. A little ground oats and barley is added to the slop to increase the milk-flow. While the pigs are young the sows are separated from them, and fed and watered on a floor. They also get exercise in this manner. When they return to the pens the pigs suck, the sows are quiet and contented, and there is less likelihood of their stepping on the youngsters than where they are fed amongst their litters. This system also helps to keep the animals and pens clean, and does much to keep the sows in good health.

When the pigs are old enough to eat, they are provided with separate pens and fed a slop made of ground oats or barley, boiled, and served warm. Oats make bone and muscle, while barley is best for fattening. Later the sows and litters are moved to individual houses in the paddocks and allowed to range at will, with such additional feeds as are necessary for the proper nourishment of the sows and the development of the pigs. Pumpkins are fed in the autumn; indeed, this breeder has found pumpkins so good a feed that he has produced a considerable acreage of them for years, purely for that purpose.

Sex Determination—Miracles that did not Work.

A good deal has appeared in poultry papers recently about a device invented by an American which it was claimed could determine the sex of any animal or egg in the embryo stage. Some of the claims made for it, indeed, were so extraordinary that we refrained from even referring to it previously. Now that it has been tested out by the United States Department of Agriculture, and found to be useless, we feel that it is well to warn farmers to whom it may be offered for sale. It is a long, tubular, plummet-shaped device made of nickel-plated iron and filled with a greenish mixture (calcium carbonate and aluminium salt) and suspended by a fine thread. When held an inch above an egg containing a male germ the stuffed tube was said to swing back and forth like the pendulum of a clock; but if the eggs were of the opposite sex the bob would describe little circles; and in the case of an infertile egg there would be no motion at all.

It was also said to tell the sex of oysters, butterflies, caterpillars, beetles, worms, and even the sex of the animal from which were obtained such products as leather and cheese. Even the criminologist was offered assistance, for it was claimed that the unfailing little detective would tell the sex of the person who shed the blood found on clothing or elsewhere. Unfortunately for those who hoped to make a fortune out of its sale the Department's experts could not get the "miracles" to work. Tests on eggs and other things by a number of persons showed that the instrument was useless. No two persons got the same results with the same eggs, and eggs known to be infertile gave positive indications that they would hatch both pullets and cockerels.

"Blackhead" in Turkeys.

On 17th November of last year the writer received a dead six months' old turkey with a note from the owner requesting a post-mortem examination of the carcass, and stating that, out of a flock of fifty turkeys, six were showing symptoms similar to those which had been evidenced by the dead bird. These symptoms were loss of appetite, progressive dullness, lassitude, and emaciation, and diarrhoea of a striking golden yellow colour. The disease had appeared in the various affected birds at intervals during a period of a fortnight previous to the date mentioned, the outbreak apparently originating in one particular turkey which was still alive, though described by the owner as a "hopeless case." The dead bird, however, had shown obvious signs of illness for only two days before death.

"Blackhead" was suspected, and an examination was immediately made of the dead bird, with the following results:—

The carcass was thin, but not emaciated, the weight being $7\frac{1}{2}$ lb. The comb and skin of the head were not darkened, but this is by no means a constant symptom of the disease. In this case the skin of the head was, if anything, paler than normal. There was considerable evidence of the yellow diarrhoea round the vent.

On the carcass being opened, the liver was seen to be enlarged to almost twice the normal size, and to be covered with greenish yellow patches, some circular, many irregular in shape, while others again were ring-like with a centre of normal liver tissue. These areas extended some distance—about $\frac{1}{2}$ in.—into the liver tissue, and their surfaces were depressed below the normal level of the liver substance. The largest area was approximately the size of a sixpence, the smallest being $\frac{1}{8}$ in. in diameter.

Both caeca were much distended throughout their whole length, their walls were $\frac{1}{4}$ in. thick, and they were filled with cheesy, greyish yellow material.

THE TREATMENT.

The disease was thus definitely demonstrated to be "Blackhead," and it was determined, with regard to the remaining birds, to adopt the Ipecacuanha treatment, as recommended by the Wegforth's (*vide* "National Poultry Journal," 9th September, 1921, p. 165).

The ailing turkeys were strictly isolated, and the fluid extract of ipecacuanha was administered in the proportion of ten drops per bird three times daily for three days; then twice daily for three days, and finally, once a day for the same period. The rest of the flock which had been in contact with the diseased birds were given the powdered ipecacuanha in the proportion of one teaspoonful per twenty turkeys twice weekly in mash, to be continued so long as any sign of disease existed on the premises.

Treatment was commenced on 20th November, and continued until the 29th. A week was then allowed to elapse and treatment again renewed.

EXCELLENT RESULTS.

The results were excellent. From the commencement of the treatment the disease appeared to be checked. The birds did not at once improve, but certainly did not get worse. The weight of the turkey in which the disease originally appeared was, on 29th November, barely 7 lb. After the second nine days' treatment, or rather during that period, all the birds began to improve, and on 12th December the weight of the abovementioned turkey—the "hopeless case"—was $9\frac{1}{2}$ lb. By that time all the birds had apparently recovered, appetite and vitality were restored, weight increased, and the droppings were normal in colour and consistency. No signs of the disease had appeared in the rest of the flock.

The owner was unwilling to send the birds to the Christmas market without first making quite certain that all signs of the ravages of the disease in the internal organs had disappeared; so the originally affected turkey was condemned to suffer for the benefit of science, and was chloroformed on 13th December.

Post mortem examination showed the internal organs to be perfectly healthy—the liver was normal in size and colour, and the caeca and their contents were also normal. The remaining turkeys were thereafter killed for Christmas, and no sign whatever of the disease was found in the internal organs of any of them.

The writer is aware that cases of "Blackhead" occasionally recover spontaneously, but surely it is too much of a coincidence that six turkeys, each of which had shown signs of disease at different times, should simultaneously show a check in the course of the disease at the commencement of the treatment, and continuous improvement thereafter.

It is interesting to note how soon—within a fortnight or so—the liver and caeca of the originally affected turkey, which were presumably somewhat similar in appearance to those of the dead bird first sent in, returned to their normal condition. It is also noteworthy that in none of the sick birds was the skin of the head darkened.

Up to the date there has been no sign of reappearance of the disease. The owner describes the treatment as "a wonderful cure."

The fly in the ointment is the cost. In the present state of the drug market the cost of the nine days' fluid extract treatment works out at approximately 1s. 4d. per bird, and that of the powdered ipecacuanha preventive treatment at 6d. per twenty birds per week. The treatment is therefore somewhat expensive, but in this instance, at any rate, the results fully justified the expense; and it is well to remember that strict isolation of affected birds will assist greatly in reducing the number of those requiring treatment.—N. Bissett, M.R.C.V.S., in "National Poultry Journal."

The Value of Sheep—Small Flocks on Small Areas.

In the course of a recent communication to the Press, Mr. T. A. Spencer, of Roma, who has had many years' experience of grazing in the Maranoa, writes very interestingly on the subject of sheep grazing on small areas, and stresses strongly our neglect in not exploiting to the full the wool possibilities of Queensland. The following points are taken from Mr. Spencer's contribution:—

The most profitable industry of all, and one that has been proved more suitable than any other in this continent, is the wool industry. In this industry we practically have a monopoly, as no other country in the world can compete with us.

The coastal portion can be left to cotton growing, dairying, and fodder crops, but the West is capable of enormous development. The demand for wool is unlimited, high prices are assured for years owing to the shortage of wool. There are 100,000,000 sheep fewer in the world to-day than there were thirty years ago, and 20,000,000 fewer in Australia. Anyone who reads these figures and is familiar with the industry must realise that unless something is done to alter present conditions there will be a further decrease in our numbers.

We find in the West, on the large holdings, owing to the fly pest, large numbers of sheep in big paddocks, and the dingo pest, that the annual losses are enormous. One station lost 40,000 sheep in one year owing to these conditions, and it is being realised that it is almost impracticable to carry large flocks in big paddocks, especially in timbered country where the carrying capacity is light.

Queensland could Treble Her Flocks.

Queensland to-day should be carrying 60,000,000 sheep instead of about 20,000,000. The losses by flies and dingoes are heavy, the losses from drought are heavy, but they can be overcome to some extent. The remedy against flies and dingoes is smaller paddocks and smaller areas. Men can handle small flocks in small areas with a comparatively light loss. The remedy against drought to a large extent is a better water supply. There are not ten stations in Queensland properly supplied with water. Stock have to travel long distances to water; in a drought they are too weak and in good seasons it is not necessary to go back for feed, consequently half the holdings are never utilised. A hundred boring plants should be going continuously either for artesian or subartesian water, or where the country is unsuitable for either, large tanks or dams should be made. What is a living area in one district will not apply to others, as the further west one goes the larger the area necessary. The Maranoa district at present carries about 250,000 sheep; it ought to carry 500,000. Practically the whole of the land in this district is suitable for sheep, but is mostly timbered and badly watered. Very few of the holdings are improved. All valueless timber should be ringbarked.

Some Essentials of Successful Settlement.

A man with 1,500 to 2,000 sheep to-day has a good income, and, compared with farming and dairying, an easy life. It takes very little more to start a small grazing farm with 1,000 sheep than a wheat or dairy farm. The areas in this district close to the railway line should be about 1,200 acres on which a few sheep could be kept, and dairying or mixed farming carried on. As one gets away from the line the areas should be increased from 2,000 up to 10,000 acres, say 70 miles from the line. This land should be cut up as suggested, all valueless timber ringbarked, and provision made for a permanent water supply by artesian and subartesian bores or tanks. The interest on the cost could be added to the rent. This would mean the settlement of hundreds of families who could not help being successful, and there would be an enormous increase in the production of wool.

Keep a Few Sheep.

My advice to every man on the land is to keep a few sheep. You may search the records and you will hardly ever see a failure among sheep owners.

Small areas as suggested will stop the spread of pear.

To increase the number of sheep and make this great industry a greater success than it is to-day smaller areas and the above methods must be adopted.

Answers to Correspondents.

Fowl Manure as a Fertiliser.

B.K. (Flying Fish Point, Innisfail)—

The Agricultural Chemist (Mr. Brünlich) advises that fowl manure is only a poor fertiliser, as it contains about $1\frac{1}{2}$ per cent. of nitrogen, $1\frac{1}{2}$ to 2 per cent. of phosphoric acid, and $\frac{3}{4}$ per cent. of potash. The best method of treating it is to allow it to rot in a pit, mixing it with litter or any other refuse. Fresh manure applied in the large amounts necessary is liable to encourage breeding of worms and insects. In well-rotted manure this risk is greatly reduced. Saltpetre would be a very expensive remedy, and its value for destroying worms and insects is doubtful.

Sorghum halepense.

J. WILSON-GREEN, Wavertree, Oakey.

The Government Botanist (Mr. C. T. White, F.L.S.), advises:—

The specimens represent the underground stems of the Johnson Grass (*Sorghum halepense*), a plant closely resembling Soudan Grass but differing in its perennial habit and underground fleshy stems (rhizomes). It is a useful fodder grass of which stock are very fond either green or as hay. It, however, can become a great pest in cultivation, almost any small piece of the underground white fleshy stem being capable of producing fresh plants. Like others of the Sorghum family (including Soudan Grass) it produces at times a prussic acid yielding glucoside and when eaten heavily by stock at those times may cause trouble and sometimes death.

The Grass Tree.

W. S. (Toowoomba)—

We have no special Bulletin dealing with this plant, but the following information supplied by Mr. C. T. White, F.L.S., Government Botanist, may be of interest to you.

Uses.—The resin or "gum" has long been an article of export and is used chiefly in the manufacture of cheap furniture polishes or wood stains, and lacquer for metal ware, also in the manufacture of linoleum. Picric acid, one of the most widely used of modern war explosives, is also obtainable from it, but it has probably little importance as a raw material in this direction. Experiments with the core as a source of alcohol, and the core and leaves of paper pulp, do not indicate much probability of commercial success.

Method of Collection.—J. H. Maiden in his "Useful Plants of Australia" gives the following as the usual method of collecting the gum in New South Wales. "The stems of the grass trees are hacked down, broken into convenient pieces, and allowed to fall into a sheet. A stout stick or flail commences the work of disintegration. The substance is then passed through a sieve, the ligneous portions of the grass tree for the most part failing to pass through its meshes. A gentle breeze is sufficient to winnow what has passed through the sieve, in order to render it ready for market; but it usually comes to Sydney having been subjected to no winnowing purpose.

Market.—There are several buyers. I think the people best for you to communicate with would be, Messrs. McGlew and Co., 138-140 Creek street, Brisbane, Messrs. Burns, Philp, and Co., Mary street, Brisbane, M. Finucan, Market street, Brisbane, and Wilfred Picken, Union Bank Chambers, Brisbane. The price is somewhere about £16 per ton. The principal seat of the industry in Australia is at Kangaroo Island, South Australia, where a particularly large species of grass tree occurs. The Department of Chemistry, Adelaide, South Australia, has issued a special booklet dealing with the grass tree gum and its method of extraction, and if you wrote to the Director he might be able to supply you with a copy. The price would be nominal.

Farm and Garden Notes for December.

Although November is regarded generally as the best period for planting the main maize crop, on account of the tasselling period harmonising later on with the summer rains, December planting may be carried out in districts where early frosts are not prevalent, provided a known quick maturing variety of maize is sown.

To ensure a supply of late autumn and winter feed, dairymen are advised to make successive sowings of maize and sorghums, to be ultimately used either as green feed or in the form of silage. The necessity for such provision cannot be too strongly urged. Farmers who have not had any experience in building an ensilage stack can rest assured that, if they produce a crop for this purpose, information and instruction on the matter will be given on application to the Under Secretary for Agriculture and Stock; also that, whenever possible, the services of an instructor will be made available for carrying out a demonstration in ensilage-making for the benefit of the farmer concerned and his immediate neighbours.

In districts and localities where supplies of lucerne are not available, sowings of cowpeas should be made, particularly by dairymen, as the lack of protein-yielding foods for milch cows is a common cause of diminished milk supplies and of unthriftiness of animals in dairy herds. Cowpeas and lucerne can be depended upon to supply the deficiency. The former crop is hardy and drought-resistant. When plants are to be used as fodder, it is customary to commence to feed them to stock when the pods have formed. Animals are not fond of cowpeas in a fresh, green state, consequently the plants should be cut a day or two before use. Economy is effected by chaffing beforehand, but the plants can also be fed whole. Chaffed in the manner indicated, and fed in conjunction with green maize, or sorghum when in head, in the proportion of one-third of the former to two-thirds of the latter, a well balanced ration is obtainable. Animals with access to grass land will consume from 40 to 50 lb. per head per day; a good increase in the milk flow is promoted by this succulent diet. The plant has other excellent attributes as a soil renovator. Pig-raisers will find it invaluable also.

A great variety of quick-growing catch crops, suitable for green fodder and ensilage purposes, may also be sown this month, notably Sudan grass, white panicum, giant panicum (liberty millet), Japanese millet, red and white French millet. Well prepared land, however, is required for crops of this description, which make their growth within a very limited period of time. French millet is particularly valuable as a birdseed crop, the white variety being more in favour for this purpose.

Successive sowings may be made of pumpkins, melons, and plants of this description.

In districts where onions are grown, these will now be ready for harvesting. If attention is given, in the case of garden plots, to bending over the tops of the onions, maturity of the crop is hastened. Evidence will be shown of the natural ripening-off process, and steps should be taken to lift the bulbs and to place them in windrows until the tops are dry enough to twist off. If a ready market is not available, and it is decided to hold over the onions for a time, special care should be taken in handling. Storage in racks in a cool barn is necessary, otherwise considerable deterioration is to be expected. Improved prices are to be looked for in marketing by grading and classifying produce of this description.

Cotton areas which were subjected to a thorough initial preparation, thereby conserving a sufficiency of moisture for the young plants, should now be making good headway and sending their taproots well down. Keep down all weed growth by scarifying as long as the growth will admit of horse work.

KITCHEN GARDEN.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered, otherwise the plants will leave off bearing. Seeds of all these may be sown for a succession. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown. All vacant ground should be well manured and dug two spits deep. Manure and dig as the crops come off, and the land will be ready for use after the first shower.

FLOWER GARDEN.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a “hard pan,” or caked surface beneath the loose soil. Alternate light with deep hoeings. A few annuals may still be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulaca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and, as the flower buds develop, give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top-dress all lawns.

Orchard Notes for December.

THE COASTAL DISTRICTS.

The planting of pineapples and bananas can be continued, taking care that the ground is properly prepared and suckers carefully selected, as advised previously in these Notes. Keep the plantations well worked and free from weed of all kinds, especially if the season is dry. New plantations require constant attention, in order to give young plants every chance to get a good start; if checked when young they take a long time to pull up and the fruiting period is considerably retarded. Small areas well worked are more profitable than large areas indifferently looked after, as the fruit they produce is of very much better quality. This is a very important matter in the case of both of these fruits, as with the great increase in the area under crop there is not likely to be a profitable market for inferior fruit. Cannors only want first-class pines of a size that will fill a can, and cannot utilise small or inferior fruit, except in very limited quantities, and even then at a very low price. Small, badly filled bananas are always hard to quit, and with a well-supplied market they become unsaleable. Pineapple-growers, especially those who have a quantity of the Ripley Queen variety, are warned that the sending of very immature fruit to the Southern markets is most unwise, as there is no surer way of spoiling the market for the main crop. Immature pineapples are not fit for human consumption, and should be condemned by the health authorities of the States to which they are sent.

Citrus orchards require constant attention; the land must be kept well worked and all weed growth destroyed. Spraying or cyaniding for scale insects should be carried out where necessary. Spraying with fungicides should be done where the trees show the need of it. A close lookout must be kept for the first indications of “maori,” and as soon as it is discovered the trees should either be dusted with dry sulphur or sprayed with the lime-sulphur, potassium, or sodium sulphide washes. Borers should be looked for and destroyed whenever seen.

Early grapes will be ready for cutting. Handle carefully, and get them on to the market in the best possible condition. A bunch with the bloom on and every berry perfect will always look and sell well, even on a full market, when crushed and ill-packed lines are hard to quit.

Peaches, plums, papaws, and melons will be in season during the month. See that they are properly handled. Look out for fruit fly in all early ripening stone fruit, and see that none is left to lie under the trees to rot and thus breed a big crop of flies to destroy the mango crop when it ripens.

Keep leaf-eating insects of all kinds in check by spraying the plants on which they feed with arsenate of lead.

Look out for Irish blight in potatoes and tomatoes, and mildew on melons and kindred plants. Use Bordeaux or Burgundy mixture for the former, and finely ground sulphur or a sulphide spray for the latter.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Early ripening apples, plums, apricots, peaches, and nectarines will be ready for marketing during the month. They are unsatisfactory lines to handle, as the old saw, "Early ripe, early rotten," applies to all of them; in fact, the season of any particular variety is so short that it must be marketed and consumed as quickly as possible. All early ripening deciduous fruits are poor carriers and bad keepers, as their flesh is soft and watery, deficient in firmness and sugar, and cannot, therefore, be sent to any distant market. The available markets are quickly over-supplied with this class of fruit, and a glut takes place in consequence. Merchants frequently make the serious mistake of trying to hold such fruits, in the hope of the market improving, with the result that, instead of improving, the market frequently becomes more and more congested, and held-over lines have to be sent to the tip. There is only one way to deal with this class of fruit, and that is to clear the markets daily, no matter what the price, and get it distributed and into consumption as rapidly as possible by means of barrowmen and hawkers. Most early ripening fruits are useless for preserving in any way, their only value being what they will bring for consumption whilst fresh. This being so, it is only a waste of time and money to forward immature, undersized, and inferior fruit to market, as it is not wanted and there is no sale for it. It should never have been grown, as it is frequently only an expense to the producer, besides which, unless the fallen or over-ripe fruit is regularly and systematically gathered and destroyed in the orchard, it becomes a breeding ground for fruit fly and codling moth, as well as of fungi, such as those producing the brown and ripe rots. Early ripening fruits should, therefore, be carefully graded for size and quality, handled, and packed with great care, and nothing but choice fruit sent to market. If this is done, a good price will be secured, but if the whole crop—good, bad, and indifferent—is rushed on to the local markets, a serious congestion is bound to take place and large quantities will go to waste. It is better to get a good price for half the crop and destroy the balance than to rush the whole on to the market and get little or nothing for it.

Orchards and vineyards must be kept in a state of perfect tilth, especially if the weather is dry, so as to retain the moisture necessary for the development of the later ripening fruits. Where citrus fruits are grown, an irrigation should be given during the month if water is available for this purpose, excepting, of course, there is a good fall of rain sufficient to provide an ample supply of moisture.

Codlin moth and fruit fly must receive constant attention and be kept under control, otherwise the later-ripening fruits are likely to suffer severely from the depredations of these serious pests.

Grape vines must be carefully attended to and sprayed where necessary for black spot or downy mildew, or sulphured for oidium. Where brown rot makes its appearance, spraying with the potassium or sodium sulphide washes should be carried out. Leaf-eating insects of all kinds can be kept in check by spraying with arsenate of lead.

Vegetables will require constant attention in the Granite Belt area. Tomatoes and potatoes will require to be carefully watched in order to prevent loss from Irish blight, and no time should be lost in spraying these crops should this disease make its appearance in any part of the district, as it can be prevented by spraying with either Bordeaux or Burgundy mixture. These fungicides effectually protect the plants to which they are applied if used in time. If leaf-eating insects, such as beetles, grasshoppers, and caterpillars, are doing damage as well, add 3 or 4 lb. of arsenate of lead to the 100 gall. of spraying mixture used for the prevention of early and late blight (potato macrosporium and Irish blight), so that the one application will be effectual for both classes of diseases.

Keep all kinds of vegetables well worked, stirring the land frequently to retain moisture, and taking care to prevent the formation of a surface crust should rain take place. Remember that vegetables require plenty of moisture; therefore leave nothing to chance, but do your best to retain all the moisture in the soil you possibly can.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF SEPTEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING SEPTEMBER 1922 AND 1921 FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Sept.	No. of Years' Records.	Sept., 1922.	Sept., 1921.		Sept.	No. of Years' Records.	Sept., 1922.	Sept., 1921.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	9.63	21	0.03	1.58	Nambour	2.53	26	3.08	3.71
Cairns	1.72	40	0.44	3.85	Nanango	1.96	40	1.06	1.66
Cardwell	1.48	50	0.10	3.09	Rockhampton ...	1.33	35	0.57	2.08
Cooktown	0.59	46	0.17	0.95	Woodford	2.21	35	2.93	4.32
Herberton	0.49	35	0.12	0.89					
Ingham	1.28	30	1.75	5.19					
Innisfail	3.69	41	2.13	8.80					
Mossman	1.22	14	0.45	2.37					
Townsville	0.80	51	0.22	1.76					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
					Dalby	1.79	52	0.68	1.25
Ayr	1.56	35	0.04	1.32	Emu Vale	1.94	26	0.35	2.82
Bowen	0.84	51	0.25	1.07	Jimbour	1.63	34	0.60	0.63
Charters Towers ...	0.81	40	0.09	1.31	Miles	1.48	37	0.56	1.22
Mackay	1.64	51	1.58	9.07	Stanthorpe	2.48	49	1.62	2.77
Proserpine	2.40	19	0.30	9.44	Toowoomba	2.26	50	1.89	3.04
St. Lawrence	1.35	51	0.73	2.26	Warwick	1.90	57	1.84	1.84
<i>South Coast.</i>					<i>Maranoa.</i>				
					Roma	1.59	48	0.04	0.64
Biggenden	1.74	23	0.45	2.22					
Bundaberg	1.80	39	0.52	0.35					
Brisbane	2.10	71	3.35	2.02					
Childers	2.01	27	0.45	1.34					
Crohamhurst	2.71	30	3.28	5.28					
Esk	2.33	35	2.20	1.66					
Gayndah	1.59	51	0.72	0.87					
Gympie	2.18	52	1.83	3.17					
Glasshouse Mts. ...	2.29	14	2.93	5.03					
Kilkivan	1.74	43	2.12	1.77					
Maryborough	1.99	51	1.10	2.49					
					<i>State Farms, &c.</i>				
					Bungeworgorai ...	1.46	8	0.04	0.58
					Gatton College ...	1.77	23	0.96	1.85
					Gindie	1.07	23	0.52	4.64
					Hermitage	1.72	16	1.66	2.28
					Kairi	0.75	8	0.06	0.49
					Sugar Experiment Station, Mackay	1.58	25	1.45	7.66
					Warren	0.83	8	...	1.40

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for September this year, and for the same period of 1921, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
State Meteorologist.

ASTRONOMICAL DATA FOR QUEENSLAND.

Times Computed by D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1922.	OCTOBER.		NOVEMBER.		DECEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	5:34	5:50	5:4	6:8	4:50	6:32
2	5:33	5:51	5:3	6:9	4:50	6:33
3	5:32	5:52	5:3	6:9	4:50	6:34
4	5:31	5:52	5:2	6:10	4:50	6:35
5	5:29	5:53	5:1	6:11	4:50	6:36
6	5:28	5:53	5:0	6:12	4:51	6:36
7	5:27	5:54	5:0	6:12	4:51	6:37
8	5:25	5:54	4:59	6:13	4:51	6:38
9	5:24	5:55	4:59	6:14	4:51	6:38
10	5:23	5:55	4:58	6:15	4:51	6:39
11	5:22	5:56	4:57	6:16	4:52	6:39
12	5:21	5:56	4:57	6:16	4:52	6:40
13	5:20	5:57	4:56	6:17	4:52	6:40
14	5:19	5:57	4:56	6:18	4:52	6:41
15	5:18	5:58	4:55	6:19	4:53	6:41
16	5:17	5:59	4:55	6:20	4:53	6:42
17	5:16	5:59	4:54	6:20	4:53	6:43
18	5:15	6:0	4:54	6:21	4:54	6:44
19	5:14	6:0	4:53	6:22	4:54	6:45
20	5:13	6:1	4:53	6:23	4:55	6:45
21	5:12	6:2	4:53	6:24	4:55	6:46
22	5:11	6:2	4:52	6:24	4:56	6:46
23	5:10	6:3	4:52	6:25	4:56	6:46
24	5:9	6:3	4:51	6:26	4:57	6:47
25	5:8	6:4	4:51	6:27	4:57	6:47
26	5:8	6:5	4:51	6:28	4:58	6:47
27	5:7	6:6	4:50	6:28	4:59	6:48
28	5:6	6:6	4:50	6:29	5:0	6:48
29	5:5	6:7	4:50	6:30	5:0	6:49
30	5:5	6:7	4:50	6:31	5:1	6:49
31	5:4	6:8	...	...	5:1	6:49

PHASES OF THE MOON, OCCULTATIONS, &c

The times stated are for Queensland, New South Wales, Victoria, and Tasmania when "Summer" Time is not used.

6 Oct.	○ Full Moon	10 58 a.m.
14 "	☾ Last Quarter	7 55 a.m.
20 "	● New Moon	11 40 p.m.
27 "	☾ First Quarter	11 26 p.m.

Apogee on 5th at 6 a.m.

Perigee on 20th at 2.42 a.m.

An occultation of Delta Tauri will take place on 10th October about a quarter past 9. With binoculars or a small telescope this will be an interesting sight as the Moon will be in the group of stars called the Hyades of which Aldebaran is the principal star.

5 Nov.	○ Full Moon	4 36 a.m.
12 "	☾ Last Quarter	5 52 p.m.
19 "	● New Moon	10 6 a.m.
26 "	☾ First Quarter	6 15 p.m.

Perigee on the 17th at 10.6 a.m.

Apogee on the 29th at 5.24 a.m.

Delta Tauri will again be occulted about 3 a.m. on the 7th; also Eta Virginis on the 15th about 9.30 p.m.; and the planet Saturn on the 16th about 5 p.m. when the Moon and it are far below the horizon.

4 Dec.	○ Full Moon	9 24 p.m.
12 "	☾ Last Quarter	2 41 a.m.
18 "	● New Moon	10 20 p.m.
26 "	☾ First Quarter	3 53 p.m.

Perigee on 15th at 1.30 a.m.

Apogee on 27th at 2.6 a.m.

Delta Tauri will be occulted about 10 a.m. on the 4th, when the Moon and star are below the horizon, but on the 31st, when it will be occulted about the time of sunset, an interesting observation of the star's reappearance may be possible in the twilight.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter, and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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